CONTENTS.

Notes upon Passing Events:— PAGE

Railways in France 369
Mr. Bailey Denton's "Farm Homesteads of England" 370
Proposed Grant of £6000 to Mr. Bazalgette by the Metropolitan Board of Works 371

Circular to Gas Companies:—

The Hanley Gas Consumers Company's Bill 372
The Belfast Gas Company's Bill 373
The Opposition to the Imperial Gas Bill 373
The Annual Report of the Manchester Gas-Meter Inspector . . . 373

Register of New Patents:—

Applications for Letters Patent 373
Grants of Provisional Protection 373
Invention protected for Six Months 374
Notices to Proceed 374

Parliamentary Intelligence:—

Progress of Bills in House of Lords 374
Progress of Bills in House of Commons 375
House of Lords Committee—Hanley Gas Bill 376
House of Commons Committee—Belfast Gas Bill 393

Legal Intelligence:—

Court of Exchequer—Hemstead *v.* the Phœnix Gaslight and Coke Company 399

Miscellaneous News—

Meeting of the Equitable Gas Company 398
Dr. Hillier's Report on the Gas supplied by the Imperial Gas Company to the Vestry of St. Pancras during the month of April 399
Meeting of the Chartered Gas Company 400
Canterbury Gas Consumers Company 402
Metropolis Gas Supply—Report of the Special Committee of the Commissioners of Sewers on Gas 402
Settlement of the Claims on the Sheffield Water Company 403
The Cheap Gas Movement at Gravesend 403

Share List of Metropolitan Gas Companies 403

Price Current 403

The Water Supply at Tunbridge Wells 404

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, May 30, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MAY 16, 1865.

Notes upon Passing Events.

We often hear, at meetings of the Social Science Society, and other gatherings of the same book-learned class, how much better railroads have been planned, and executed, and worked in France than in England. Commercial travellers and forwarders of merchandise tell a different tale, although, perhaps, in not very literary language. We can, however, now present to our readers the opinion of a distinguished writer in a French periodical of the first class—M. Edouard Boinvilliers, of the *Revue Contemporaine*. M. Boinvilliers begins by saying that, in 1865, France will have to decide if she is rich enough "to throw £40,000,000 sterling into the sea—a sum of money "with which divers great things, according to the taste "of divers individuals, might be accomplished. With "£40,000,000, gratuitous primary education might be "afforded to all France, or Poland might be liberated from "Russia, or the Pope made independent (of his enemies), or "the charities of France so well supplied with funds that not "one aged or infirm person, or one foundling, or one young "girl, would need to remain in indigence." This vast capital is required to complete the net of railways in France, and make good the blanks, which remain under the French system of railway construction. We have had our railway trials ourselves. Misery and bankruptcy sat at many respectable hearths—widows and orphans, in no small number, were reduced to pauperism—when the reaction followed the 10 per cent. amalgamation mania, and the wild extensions, and wilder competitions, in the days of King Hudson. But we got our railways made, and they are all at work except the short bit to Newmarket, and the national exchequer never suffered. No class ever paid an extra tax to prop up the dividends of a branch-making company, or to help an agricultural district with mere agricultural traffic to the luxury of a first-class line. The coal consumers have been lately excited by the burking of a coal junction line to the North, through the fear of private parliamentary influence; but that disappointment seems a trifle when compared with the isolated condition of large tracts of France, as painted in the petitions which led to the large and hopeless railway guarantee which excites the fears and arms the pen of the French reviewer. France adopted the system of Government control and Government assistance to railways very early, in preference to relying on private enterprise and making use of foreign capital. For large advantages the railway companies bound themselves hand and foot to the State. The first results to the railway companies were most profitable: the final working out of the scheme seems likely to be equally ruinous to the dividends of the companies and the finances of the empire. The Orleans Railway, in 1840, was the first line that received Government assistance. Then followed the line from Strasbourg to Basle. In 1842, it being still found impossible to obtain sufficient capital for railway undertakings on Government conditions from private enterprise, all the companies received enormous subsidies. Notwithstanding this assistance, it was, a few years later, found impossible to complete certain lines. In 1847 the Government was obliged to advance funds to the line from Lyons to Avignon, and from Bordeaux to Cette. In 1848 the Paris and Lyons Company was in distress; in 1850 it was the turn of the Orleans to Bordeaux, and of Tours to Nantes. In 1852 all these lines received, by way of encouragement, a concession for 99 years, and in 1859 the railway companies solicited and obtained a guarantee of $4\frac{3}{4}$ per cent. on all the capital expended in completing their respective systems in case the extensions did not pay their expenses. For in 1857 the companies had accepted, or rather been compelled to undertake the execution of an enormous length of lines of the second and third degrees of traffic, some of these extensions costing as much per mile as the main trunk lines. Money in 1859 was worth from 6 to 7 per cent. With the guarantee of the State, the companies were able to borrow at $5\frac{1}{4}$ per cent, and that was still a heavy burden. It was expected that these railway extensions would at any rate pay their working expenses; but, up to the present time—although, of course, the most profitable lines have been first taken in hand—the result has been the steady diminution of the average earnings per mile of the French railways just as the average dividends of the English railways were for many years diminished by the same cause—extensions, without, however, aid from the national exchequer. The French averages fell in a manner that may be represented by the following figures:—In 1861 the average revenue may be called 47; in 1862, 45; in 1863, 42; and in 1864 it was still falling, and all this time the State was paying the guarantee. "Magnificent machinery for conveyance has been provided, "but the goods and the people to be conveyed are both "wanting." The loss on working the extensions of the Lyons Company amounts to 70 or 80 per cent. per mile, and that is one of the most favourable examples of the guaranteed lines. In fact, "a large capital has been sunk by the State in "an undertaking which has proved a total failure, and the "payments are continued in order to compel the companies to "continue to lose money in an hopeless speculation, per-"sisted in for political reasons." The French reviewer goes so far as to assert, with illustrating figures, that in certain rural districts, as yet unprovided with railways, it will be cheaper to pay the travelling expenses of all the inhabitants and their merchandise than to make railways on which payment, at some price, must be made for the transport of both. Anything, he maintains, is better than for the State to continue to pay $4\frac{1}{2}$ per cent. in order to compel railway companies to lose another $1\frac{1}{2}$ per cent. on the construction of lines that have not and never will have a paying traffic.

At this stage of his subject M. Boinvilliers breaks off to

explain the one cause to which he attributes the difficulties, and even dangers which have impeded the free construction of railways. Our parliamentary reformers and anti-reformers will read this part of his essay with interest and amusement. It is almost surprising that so remarkable a passage should have escaped the omnivorous reading of Mr. Robert Lowe previous to his great speech on the suffrage question. "Democracy," he writes, "is a very fine thing, with which it is "not our habit as Frenchmen to find fault, but like all other "political systems it has its disadvantages." "French "democracy worships equality—that is its first want and "dearest delight. French democracy can put up with the "want of every other political privilege if equality be con- "ceded, and it is always ready to turn everything topsy-turvy "to obtain equality. When a foreign enemy has to be repulsed, "the French march gaily to death or victory; but when the "right of the people, either as regards each other or in refer- "ence to the Government, has to be discussed, the endless "jealousies confuse and retard the settlement, because the "question is not only how to be happy and richer, but, above "all, how to be richer and happier than your neighbour, or, "at any rate, to so legislate that he shall not be richer and "happier than you are." There are many Frenchmen who consider that the law of equality will never be in real force until there are neither rich nor poor in the land. This feeling is not confined to the peasantry, it pervades all classes. "We "Frenchmen are so constituted that we cannot enjoy our own "good fortune from our envy of that of others equally or more "fortunate." In fact, to call things by their right names— "envy is the cancer of democracy—that is, hatred of all "natural or acquired superiority!" That such is the case is proved by the history of our railway companies: they made way but very slowly when first introduced. France was then governed by a *bourgeois* aristocracy. Every deputy worried the Government to get a line through his district, and to have the main trunk through his chief town; and the Government having all to please, did nothing. Enfeebled by unjust demands, and alarmed by the envious spirit of equality, it did not dare to sanction great companies on liberal terms, which was the only mode of obtaining iron roads without heavy charges on the national budget. Small companies were founded to make short railways; and consequently the State was obliged, in 1842, to lend them money. In addition, the companies were encumbered with rules, which exhibit in a remarkable manner the hostile spirit in which such associations were regarded, and make one wonder how any commercial company could survive such a deluge of minute and harassing regulations. For instance, in 1846 the "*ordon-* "*nances*"—we have no English word to express this French bureaucratic ukase—regulate the following matters, which in England are settled in the office of the engineer or secretary:— "In respect to the maintenance of the permanent way," the Minister of Public Works must give "the needful directions." As to the resident plate-layers, police, &c., the minister is to fix the number. The arrangement at level crossings, the minister is to regulate it; "the sidings required," the minister will fix where they are to be made. The minister also gives orders as to how the rolling stock is to be maintained in good order, to fix the number of breaks, give orders as to lamps needed for each train, regulate the number and nature of the signals, &c. The spirit in which these regulations were framed is only too evident. If the ministerial department had not exercised considerable discretion, the railway companies would have been ruined. Even at the present time, scarcely a day passes without an official despatch from a minister of State or a prefect, involving a correspondence with the chief officers of the different companies. One morning not long since a certain railway company received an imposing despatch from a great personage. The seal was broken with due respect, and there appeared first a grave enumeration of the rights of the Government and the duties of railway companies; after this solemn exposition of rights and duties, the despatch concluded by peremptorily insisting that "*the bar-keeper at* "*Blank-Blank station should be requested to reduce the price of* "*his dishes of veal and fowl by 25 per cent.*" The managing director in reply, with many excuses for so great a liberty, pointed out that the law which gave prefects the superintendence of this department, allowed them to dismiss a bar-keeper, but not to lower the price of the provisions sold. To this came a rejoinder. How the matter was concluded is not exactly known; probably in a compromise, reducing the price of plates of veal and fowl by 12 or 13 per cent. The Empire, which put many men and things to rights, had a very happy influence on railway undertakings. All the small railway companies were amalgamated into five or six great companies, and the terms of their concessions was increased. The advantages of this system were soon felt; within a few years, on all the iron roads the cost of conveying merchandise was reduced 40 per cent. below the tariffs originally fixed. Prosperity followed the change, but very soon the question of differential charges raised a formidable opposition, in which all the rivals of railroads actively joined. The carriers, the coasting trade interest, the river boatmen, the agents and brokers, the municipal authorities—who considered themselves injured because merchandise was no longer loaded, unloaded, reloaded, and taxed at Rouen, Orleans, Amiens, Strasbourg, and Lyons—all united and conspired to crush their common enemy. The text of the opposition was "An infraction by the railway companies "of nothing less than *the principles of* 1789; *of equality before* "*the law—of that precious equality so dear to our French demo-* "*cracy.*" That is to say, the railway companies conveyed a truck of merchandise, travelling a hundred miles, cheaper than one travelling only ten miles. This was termed a grave crime against the constitution by an official orator in the Senate in the grandest language. At length, after a long struggle, it was admitted that the principles of 1789 did not entitle every Frenchman to ride in a first-class carriage at third-class fares. But while the right to differential tariffs, according to distance, was conceded, the right to make special bargains was taken away. A, who forwarded a thousand tons at a time, was not permitted to have any advantage over B, who only sent ten. This absurd law was a concession to democracy and the principles of 1789, which, it may be observed in passing, always seem to favour the single shoemaker much more than the multitude who make shoes. The consequence is that, as the railway companies are not permitted to make bargains, they are not in a position to solicit custom and get new business; for they have no special advantages to offer.

In 1857, being then supposed to be in a high state of prosperity, as shown by magnificent dividends, the great main trunk lines of France, under the moral pressure of the Imperial State, accepted the right or duty of constructing an additional network, to cost £120,000,000 sterling. But in two years the companies were sick of their white elephants, and cried out that they were about to be ruined. The end was that they received a guarantee of 4¾ per cent. on the money they were about to borrow. This was the law of 1859. It was the result of a new kind of claim to "*equality*" invented at that period, less easy to resist than inequality of fares and tariffs, and a hundred times more mischievous in its results. All the provinces of France were publicly declared to be entitled to a railroad. The "disinherited provinces"—that was the term in vogue—claimed justice from the patriotism of "the nation, and at the hands of a sovereign sympathizing "with all undeserved sufferings." The moment was come for assisting the unhappy provinces, whose taxes had already contributed to establish existing lines. Accordingly, popular democratic clamour prevailed, a vast extent of permanently unprofitable—in fact, political—lines were authorized, for which the nation has paid much and must pay more; while it is plain to impartial bystanders that it would, as already observed, be cheaper in many of the districts to give free conveyance to all the peasantry and all their produce by ordinary routes, than to construct railroads which must charge something for their services. The engagements of the French companies which were unexecuted in 1865, and which they are bound to complete within ten years, amount to £100,000,000 sterling—the greater part over worse territory than that traversed by our Great Eastern. On this the Government guarantees 4¾ per cent. The result is ruin to the companies and serious injury to the finances of France. And this is the system, the direct consequence of Government interference in railway construction, recommended to our imitation by Mr. Edwin Chadwick and his school—a system under which, as the reviewer tell us, all railway officials have become Government functionaries, without zeal, because without power and without hope.

Mr. Bailey Denton, a practical man, who has all his life studied every branch of science connected with his profession, has successfully completed a new and valuable contribution to agricultural literature, "The Farm Homesteads of England" —a book for the benefit of the increasing class of landlords who desire to make the most of their estates by furnishing their

tenants with all the materials for thriving. There was a time in the history of English agriculture when any rude home-made sheds were considered sufficient for a farm, and the tenant was very unreasonable who was not satisfied; but the art of breeding the most profitable live stock, the careful study of the properties of manures, the use of purchased food and of implements and machinery of a powerful and expensive character, have rendered it necessary that farm buildings, instead of being mere sheds, should partake of the scientific character of a factory, where the labourer never turns back from the time that he takes up the raw material until he turns the finished work out of hand, and where all the materials of labour are carefully protected from any kind of deterioration. It may at once be admitted that a vast number of landlords and tenants are compelled, by force of circumstances, to be content with modifications of existing buildings. They have not the means, like manufacturers, of clearing all the old rubbish away, and starting afresh. Nevertheless, it is of the utmost importance that, even in the cases where capital is scarce, those who have undertaken to amend and add to an old homestead should have right principles before their eyes. Still more important is it that the wealthy nobleman, or the manufacturer, attorney, or banker retired from business, and anxious to be identified with the aristocracy of the county, should know what to do and what to avoid. Plenty of writing we have had on this subject, with plenty of fancy plans drawn with great ingenuity and taste, often regardless of expense, before Mr. Denton came into the field, and gave the landed gentry the result of his long experience. We like his book on this thoroughly practical subject, because he puts in the foreground not his own fancies or plans, but the plans of the best men, working for landlords who desired the best possible arrangements. Mr. Bailey Denton gives perspectives, elevations, ground plans, and detailed sections of twenty-seven different farms, selected to illustrate the accommodation required under various modes of husbandry. The examples of pasturable and permanent grass are taken from Gloucestershire, Staffordshire, Cheshire, Wiltshire, and Herefordshire; those of tillage or arable, including fen and wold, from Lincolnshire and Yorkshire, Cambridge, Norfolk, and Huntingdon; mixed husbandry from Oxford, the Isle of Ely, Cambridge, Cornwall, Wilts, and Essex; and a section is devoted to pleasure and suburban farms, like the Flemish Farm, cultivated by the late Prince Consort. Twenty-three of these designs are by different architects, one only—that of Lord Palmerston's—being by Mr. Denton himself. Two are designed by the owners, and one, a dairy farm, by the tenant. As to the principles of farm construction, in new buildings the first point is in the site; that should be as nearly as possible equi-distant from the cultivated parts of the farm. There is, perhaps, a temptation, for first convenience, to draw as near as possible to the high or parish road; but, by a very simple calculation, Mr. Denton shows the daily loss of labour of horses and men, where the homestead stands at one extremity instead of in the centre of a farm. The next and most important points are the shelter of stock and convenience for the manufacture of manure. No point has been more clearly demonstrated by practice and science within the last 20 years than that shelter, with due regard to temperature and ventilation, means more flesh and less food. Well-designed farm buildings involve, first, increased shelter for stock; second, better preservation of manure; third, greater value of straw as food. There is a very long distance between the ancient practice of keeping stock just alive during the winter with a little hay, and laying on a little fat in summer on good grass, and the most improved modern style of feeding all the winter in comfortable sheds on roots, with straw, chaff, cake, corn, or lentils. Whether store cattle may not suffer more in health and strength than they gain from food in winter under cover is a matter still in dispute; but as to cattle to be made fat, there is no question that warmth, with good ventilation and perfect quiet, will pay good interest on buildings, and produce manure at least one-fourth more in value than that made in yards open to rain and wind, snow and frost. Under the system of feeding bullocks in open yards in winter, a great share of the fodder consumed goes to give warmth, where it might, under better arrangements, go to make meat.

There is such a scarcity of meat in this country, a scarcity that is more likely to continue than diminish, that this question of shelter on farms becomes in the highest degree interesting. It was a great step in advance when the system of feeding a comparatively few stock in boxes first came into vogue. That system has fully been established, but of late years a further advance has been made in the plan for entirely covering over cattle-yards, and thus extending complete shelter to all the stock, and entirely excluding rain from the manure heaps.

A very important discussion, which chiefly turned on the value of covered cattle-yards, took place at the Central Farmers Club, in the first week of this month, opened by a paper read by Mr. Denton himself. Seldom has the benefit of discussion been more evident. A company of farmers were reminded that even in 1865 the most barbarous practices prevail in counties that have every opportunity of being well informed. In Cheshire thousands of tons of cheese are sacrificed to the want of shelter in the fields and ventilation in the cowhouses, and a Cheshire baronet is to be found and cheered when he declares that he not only dislikes the broad-breasted bulls, which alone are worth a breeder's attention, but he likes rushes and hates the drains that kill them. At the Farmers Club, all the opinions expressed were in favour of shelter for the sake of the stock to be fattened, and manure to be manufactured; but when the question of yards entirely covered was raised, graziers and breeders of great intelligence argued that what might be gained in warmth would be lost in delicacy of constitution, and that it was not safe to run the risk of depriving young stock of that rough hair which grew from exposure to the air and was lost in covered yards. If, said Mr. Charles Howard, they intended to fatten their animals off before spring, a covered homestead was very desirable; but if they had young stock which had to be grazed during the coming summer, the case was different. The breeders in midland counties would not like to have animals without any hair upon them; and if they put a beast under cover, the hair fell off and the beast became unfit for summer grazing. In fact, in this discussion there was no dispute about the necessity for ample shelter, or about its economy; and the advantage of at least one covered yard was generally admitted. On the subject of the value of straw, Dr. Voelcker made the following important remarks, which, as regards the chemical power of that substance, are new to the farming interest:—

Straw contained very little of those manuring constituents which conferred value upon the excrements of animals, and which gave value also to artificial manures. In fact, straw as a direct manuring agent, was not worth carting to the field. In the second place, he would say that straw possessed a very considerable value as food—a value which he did not think was overestimated by the figures which Mr. Bailey Denton had given them—namely, 37s. a ton. Some kinds of straw were considerably above that value, as, for example, oat-straw, and pea-straw which was not too ripe. Straw had an important mechanical effect when carried to the field; but it was questionable whether that effect might not be realized, by other means, at a cheaper rate. But straw could not be totally dispensed with as a means of making manure, because it not merely produced a mechanical effect in the preparation of manure, but also produced an important chemical effect. When straw gradually decomposed, it produced a number of acids which had the power of preserving ammonia; and it fixed them with such a force that no chemical fixer, such as vitriol or gypsum, required to be used in the preparation of farmyard manure. It was, however, a quality which it only displayed when it rotted gradually. Straw in dung, when overheated, ceased to be a fixer of manure. When the temperature of farmyard manure was increased a little above 180°, the desired effect ceased. If they used too much straw in preparing it, there would not be enough liquid, whether it were urine or rainfall; the fermentation became too strong and the heat increased beyond the proper temperature, in consequence of which ammonia flew off. It was quite possible, by an excessive use of straw, to make bad manure under cover, as well as in open yards; it was therefore a matter of practical importance to regulate properly the quantity of straw in the stalls or fattening-boxes. He need not speak of the superior value of the liquid over the solid excrementitious matters of dung, for that was well known to intelligent farmers; but there was a chemical point to which he must be permitted to direct attention, and it was this: the liquid portion of rotten dung had a most active power of dissolving the more valuable fertilizing matters of the solid excrements of animals. They knew, for instance, that phosphate of lime—the material on which principally the value of bone-dust depended—was insoluble in pure water, but he found it to be soluble to a great extent in liquid manure. As the liquid in rotten dung dissolved a large proportion of the more valuable constituents of the solid excrements, they would now see an additional reason for preserving their liquid manure, for in so doing they would not only retain the fertilizing matters in urine, but they would also prevent the waste of the most valuable constituents of the solid excrements.

It is fortunate for the progress of agriculture in England that we have an increasing number of landlords intelligent enough, and rich enough, to profit by such works as Mr. Bailey Denton's, and such discussions as that at the Farmers Club. With a race of the peasant proprietors whom Mr. Newman Hall considers politically so essential, we should soon have no mutton except from the hills, and very little beef, while stolid ignorance would have a permanent stronghold in such hard-working men.

The Main Drainage Committee of the Metropolitan

Board of Works have not recommended that Mr. Bazalgette should have the £10,000 which he expected for his Main Drainage Works, but they report in favour of giving him £6000, and bestowing £4000 amongst his assistants. Mr. Bazalgette is not very popular with his profession, because he is considered, if we may judge from the tone of the discussion at the Institution of Civil Engineers, to have strutted rather too proudly in borrowed plumes. But no one denies that he has carried out the work entrusted to him with skill, industry, and remarkable success; and that he has been miserably underpaid. Under these circumstances, the public, who have nothing to do with Mr. Bazalgette's character, except as an engineer, will be glad to see some attempt made to make his remuneration more in character with the importance of his work. Of course, there will be some virtuously acid tradesmen protesting against the principle of presents in addition to salary—some liberal speeches, in an economically cheese-paring sense, will be made; but the board will no doubt end by deciding not to conclude a great work with a shabby transaction.

Circular to Gas Companies.

The clique of professional agitators who, under the title of the "Towns Protection Agency," promote their own interests by fanning the flame of discontent wherever they may find it smouldering in the hearts of gas consumers, have had a partial success in the Hanley Gas Bill. Not, indeed, that the Bill which they promoted has received the sanction of Parliament, but they have contrived to get their expenses paid on consenting to withdraw it. If their professed object had been genuine, such a result might be considered a failure; but it will, no doubt—partially, at least—answer their purpose. The machinery by which the "Agency" conducts its operations is clearly exposed to view in the full report of the proceedings on the Bill which will be found elsewhere in our present number. A solicitor is found who is acquainted with the gentlemen of the locality, and he proceeds to sound them as to their opinions respecting the gas supply of the place. The superior quality and the lower price of gas in other towns in the neighbourhood are pointed out, and the advantages not only to gas consumers but to speculators are temptingly held forth. A company is quickly formed, with a capital in £1 shares, and many persons are induced to risk so small a sum, in the hope of sharing the promised gains. It is somewhat surprising, indeed, that under such circumstances the applications for shares are not more numerous; and in the case of the Hanley Consumers Company they were hawked about and accepted by attorneys clerks in London, and others who could do little more than pay the first deposits of 1s. each per share. A sufficient amount of such deposits, however, would pay the expenses of promoting the Bill; and the withdrawal of it on the fifth day's hearing before the committee on payment of costs may be considered by the Towns Protection Agency as a triumph.

The circumstances of the case are peculiar, and justify a detailed notice of the conditions under which Hanley has hitherto been supplied with gas. It forms one of the cluster of towns in North Staffordshire known as the "Staffordshire "Potteries," the antagonism among which is proverbial. About 35 or 40 years ago a company, formed under a Deed of Settlement, erected gas-works at Etruria, in the centre of "the "Potteries." That company was called the British Provincial Gas Company, to distinguish it from the British Gas Company, by which the eastern parts of the metropolis were then lighted with gas under the powers of an Act of Parliament. From Etruria the British Provincial Gas Company extended their supply of gas to Hanley, Burslem, Tunstall, Stoke-upon-Trent, Fenton, Longton, Longport, and other neighbouring towns. In the year 1837 a local company was formed, which at a later period was registered under the 7 and 8 Vic., c. 110, for lighting Burslem and Tunstall; and in 1843 there was another company formed, under Deed of Settlement, for lighting with gas Stoke-upon-Trent, Fenton, and Longton. In 1857 the first-named company obtained parliamentary powers; and in 1858 the Stoke-upon-Trent, Fenton, and Longton Company and the British Provincial Company were each of them before Parliament with Bills. The result was, that the Burslem Company were restrained from supplying gas in Hanley or Tunstall, and the Stoke Company from supplying gas in Hanley and Tunstall. The British Provincial Company were therefore left in possession of those districts, which they have retained since 1858, with parliamentary powers to break up the roads. The maximum price to be charged for gas was fixed at 5s. per 1000 cubic feet, and the minimum illuminating power at 10 sperm candles. The price actually charged was 4s. 6d. per 1000 feet till Dec. 31, 1862, when it was reduced to 4s. 3d.; and again, on July 1, 1864, to 4s. per 1000 feet, the illuminating power of the gas during the time having averaged 13 or 14 candles. The dividends on the new capital were limited by the company's Act to 7½ per cent., and on the old capital they were limited by the Gas-Works Clauses Act to 10 per cent. These dividends, however, were not attained, and the profits of the Hanley and Tunstall works for the year ending June 30, 1859, were deficient £1438 of the prescribed amount. The deficiencies during the four following years amounted to £1608, £966, £1376, and £661 respectively. In 1864 the profits for the first time exceeded the prescribed rate of dividend; and on the following January the company reduced the price of gas to 3s. 6d. per 1000 feet. The cost of coal, after deducting the fuel and the value of the residual products, is about 4s. 8d. per ton. The total cost of the gas at the burners was about 2s. 4¾d. per 1000 cubic feet, and the dividends authorized by the company's Act would have amounted to 1s. 8¾d., making together 4s. 1½d. per 1000 feet. This was the state of affairs when the promoters of the new company came upon the scene. They thought they perceived a favourable chance for launching a competing company, which, whatever might be its success, would be beneficial to themselves; for their interests and those of the consumers of gas at Hanley were by no means identical. In July last they published their prospectus, in which they offered to supply the public lamps by average meter indication. They offered 14-candle gas during the first year of their operations at 3s. 4d. per 1000 feet, and at a less price afterwards. It was proposed to limit the dividends of the company to 10 per cent. so long as the price was 3s. 4d., and to have power to pay a higher dividend as the price of gas was diminished. It was also set forth, as one of the advantages offered by the company, that their gas might be tested at all hours without notice. The company started with a rather extensive staff of provisional directors, architects, surveyors, local engineers, consulting engineers, solicitors, parliamentary agents, auditors, and secretary, and when the accounts come to be taxed some estimate may be made of the interest each took in swelling them to the proportions to be paid. It may be observed, as an indication of the source whence the Hanley Gas Consumers Company, Limited, emanated, that the temporary offices were in London at the same place as the office of the consulting engineer.

The narration of the alleged grievances of the gas consumers of Hanley was patiently listened to during three days by five noble lords, and it had the effect of impressing them with the notion that some of the alleged grievances were more or less well founded, as the committee suggested a compromise before the whole case of the opponents had been heard. After some discussion this was assented to, the opponents agreeing to pay the costs of the promoters from the date of registration of the new company, and engaging to bring in a Bill next session to secure to the public the continued supply of 14-candle gas at 3s. 6d. per 1000 feet, and to secure to them other advantages which the new company promised by their Bill. The result of this contest in the committee of the House of Lords shows that it would have been preferable for the interests of the British Gas Company, if, instead of making premature concessions, they had met their opponents with a Bill of their own, as was done by the Birmingham and Staffordshire Gas Company last year, and by the Exeter Company this session. By reducing the price to 3s. 6d., in January last, the company seemed to admit that they could afford to supply gas at that rate, and it was useless to contend, therefore, that such a price was not remunerative.

We are gratified to observe, on the part of those who were opposed to the established company, a great improvement in the spirit in which this contest has been conducted, compared with that exhibited last year. There has been a marked absence of the reckless imputations of fraud on gas companies which formerly excited such general indignation. An attempt was made to show that the company had failed to supply gas of the prescribed illuminating power, but the evidence to that effect was remarkably and even ludicrously defective. It had been asserted by one of the principal earthenware manu-

facturers of Hanley, that the smoke from the manufactories "is ascending in volumes day and night all the year round, so "that when the atmosphere is heavy the smoke is beaten "down, and we can scarcely see many yards before us." It necessarily requires a very brilliant gas to penetrate such a murky atmosphere, and the general allegation that the town is badly lighted would, under such circumstances, be no imputation on the quality of the gas. The general evidence given on that point, therefore, and the experiments of Mr. Russell, the late manager of the Uxbridge Gas-Works, and of Mr. Forbes, the engineer of the company, do not possess sufficient weight to call for contradiction; while the experiments of the secretary, the ex-minister of the gospel, and present keeper of "an "establishment for the manufacture and sale of boots and "shoes," almost rival in absurdity the celebrated evidence of Mr. Slee, of Tooley Street, on the Metropolis Gas Bill, who undertook to prove the cost of the manufacture of gas in London by making gas in a tobacco-pipe!

A case of a different character, but presenting some important features, has occupied the attention of a committee of the House of Commons, and been carried without any material alteration. In 1823 an Act of Parliament was obtained for the formation of a company to light Belfast with gas. The shares had been, in the first instance, offered to capitalists resident in that town; but they were not taken, and ultimately they fell into the hands of a banking-house at Leicester and its connexions. The capital authorized by the Act to be raised was £35,000, but that amount was soon found to be insufficient for the purposes of the undertaking; and the baneful system of expending nearly the whole of the profits on the works was resorted to to such an extent, that only three dividends of 5 per cent. each were paid in 29 years. During that period, however, £36,349 had been expended in extensions, and, taking into consideration that the public lamps had been lighted for 20 years at a loss to the company of nearly 2s. per 1000 feet on all the gas supplied to them, the undertaking had proved to be moderately successful. In 1852 the company determined to put an end to their then anomalous position, and applied to Parliament for an Act to enable them to capitalize the invested profits, and to raise additional capital. Instead, however, of attempting to capitalize the whole of the £36,349, they preferred to accept £21,000 in 10 per cent. dividend-bearing shares, and obtained power to raise £50,000 of new share capital, also at 10 per cent. The whole of this new capital having been expended, they applied to Parliament again this session to raise £94,000 more; and, to justify the propriety of that enlarged capital, they proved that the consumption of gas had doubled during the last ten years, and that the increase within the last nine months had been at a still greater ratio. The Town Council opposed the Bill on several grounds, the main one being that, as they had the power to build gas-works themselves, or to purchase by agreement the existing works, the great proposed extension would add to their value, and thereby diminish the ability of the Corporation to make the purchase. Objections were also taken to the proposed dividend of 7 per cent. on the new shares, and a suggestion was thrown out that 5 or 6 per cent. would be sufficient. The petitioners against the Bill further objected to the quality of the gas, to the existing supply, to its price, and to the mode of testing its illuminating power; but those points had not been raised before the referees, and could not therefore be examined by the committee. The opponents to the Bill obtained little by their opposition, for the committee thought the proposed capital and rate of dividend reasonable, but they granted the publication of the accounts in the Birmingham form. This concession, considering that the company is, as it were, a foreign one, and not locally connected with Belfast, does not seem unfair.

Opposition has unexpectedly arisen to the Imperial Gas Company's Bill in the House of Lords. On Thursday evening the Bishop of London rose armed with three petitions against the Bill, founded on the ground that if passed it would prove a public nuisance to the neighbourhoods of Chelsea and Fulham, where great extensions were proposed to be made to the works; and he appealed to their lordships not to allow of such a destruction of private property, and of such injury to the health of the inhabitants, as the extension of the works would occasion. On the same evening Lord Ravensworth also presented a similar petition from the vicar, churchwarden, and overseers of Fulham, and was equally urgent in calling on their lordships not to let the Bill pass. There is no doubt that a gas-work is not a picturesque object to look at from any point of view, nor can it be denied that there will occasionally issue from the vicinity of the retort-house and purifiers odours different from those that are distilled from the alembics of Professor Rimmel. Yet it may be confidently asserted that to describe a well-conducted gas-work as injurious to the health of the neighbourhood is contrary to fact, and that such an opinion is a relic of prejudices founded on practices that have long since been exploded. In the days of "blue billy," indeed, the stench that issued from gas-works was an intolerable nuisance, and the contamination of the neighbouring watercourses, by emptying the refuse lime water into them, was a thing to be seriously complained of. But at the present day the mode of purification has been completely changed, and there is no particle of the residual products of gas-making that is not turned to use. They are all too valuable to be thrown away, and if a volatile emanation should at any time escape it is so much property flying away, which the gas companies would do their best to retain. The attempt to raise an outcry against gas-works, on the ground that they are nuisances injurious to health, is the revival of an old prejudice which we thought had become extinct; and it is to be hoped that the House of Lords will not be led, by impressions of former experiences of the neighbourhood of gas-works, to condemn the extension of a well-conducted undertaking with all modern appliances to prevent nuisance of any kind.

It appears from the annual report of the inspector of meters for the city of Manchester, for the year ending 1864, that the total number of meters tested by him during the year was 7431, for which he received in fees £220. 18s. This exhibits an increase on the previous year of 67 meters. The number of new meters tested exceeded that of the old in the proportion of 5853 to 1578. The proportion of dry meters was 5051 to 2380, but the inspector observes that there has been a large increase in the number of wet meters tested during the year, owing to the Gas Committee of Manchester having substituted wet meters for dry in all cases of hired meters.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1191.—Julian Bernard, of Lincoln's Inn Fields, London, gentleman, for "*Improvements in apparatus for raising water and other fluids, and in raising and lowering such apparatus.*" April 28, 1865.

1210.—Charles Edward Herpst, of 3, Rue Jean Jacques Rousseau, Paris, mechanical engineer, for "*Certain improvements in pumps.*" A communication. May 1, 1865.

1226.—Thomas Russell, of Wednesbury, tool-maker, for "*Improvements in valves for liquids, steam, and gases.*" May 2, 1865.

1229.—Thomas Allcock, of Birmingham, brass-founder, for "*Improvements in finishing and polishing metal tubes and rods, and in apparatus or machinery to be employed therein.*" May 2, 1865.

1242.—Carl Gustav Lenk, of Dresden, now of 6, Laurence Lane, Cheapside, London, for "*An improved process for purifying water.*" May 3, 1865.

1266.—Israel Swindells, of Wigan, Lancaster, chemist, for "*Improvements in the manufacture of coal gas.*" May 6, 1865.

1268.—William Charles Cropp, of Oaklands, Park Road, Clapham, for "*Improvements in carriage-lamps particularly, and all lamps of a reflecting nature generally.*" May 8, 1865.

1287.—William Jackson, of Glasgow, for "*An improved method of mixing gases and vapours, and in the machinery or apparatus connected therewith.*" May 9, 1865.

1296.—Edward Myers, of Millbank Row, Westminster, civil engineer, for "*Improvements in wet gas-meters.*" May 10, 1865.

1299.—Peter Armand le Comte de Fontainemoreau, of 10, Rue de la Fidélité, Paris, and 4, South Street, Finsbury, London, for "*Certain improvements in apparatus for illuminating.*" A communication. May 8, 1865.

1311.—George Mountford, of Grasscroft, York, manager, and Edward Worrell, of Upper Mill, York, plumber, for "*Improved apparatus for cutting, turning, and smoothing metal pipes and the surfaces of bolts, rods, or spindles.*" May 11, 1865.

GRANTS OF PROVISIONAL PROTECTION.

986.—Pierre Hugon, of Paris, engineer, for "*Certain improvements in gas-engines.*" April 6, 1865.

1058.—Charles Forster Cotterill, of Cannock, gentleman, for "*Improvements in pipes for conveying water and gas, and for other like purposes; and a new or improved composition for joining the said pipes and other similar pipes.*" April 13, 1865.

1072.—Thomas Newbigging, gas engineer, and Alexander Hindle, gas-fitter, both of Bacup, for "*Improvements in wet gas-meters.*" April 17, 1865.

1074.—Louis De St. Céran, gentleman, of 51, Rue de Malte, Paris, for "*Certain improvements in gas ammoniacal engines.*" April 17, 1865.

1099.—Meguerditch Houssepian, of Manchester, merchant, for "*Certain improvements in pumps.*" A communication. April 20, 1865.

1101.—WILLIAM CLARK, of 53, Chancery Lane, London, engineer, for "*Improvements in taps or stop-cocks.*" A communication. April 20, 1865.

1109.—FRANCIS WISE, of Chandos Chambers, Adelphi, London, consulting engineer, for "*Improvements in gas-regulators, and valves for the same.*" A communication. April 20, 1865.

1150.—THOMAS WALKER, of Birmingham, engineer, for "*Improvements in means or apparatus for measuring the flow or passage of liquids, which improvements are also applicable in obtaining motive power.*" April 25, 1865.

1191.—JULIAN BERNARD, of Lincoln's Inn Fields, London, gentleman, for "*Improvements in apparatus for raising water and other fluids, and in raising and lowering such apparatus.*" April 28, 1865.

1226.—THOMAS RUSSELL, of Wednesbury, tool-maker, for "*Improvements in valves for liquids, steam, and gases.*" May 2, 1865.

INVENTION PROTECTED FOR SIX MONTHS BY THE DEPOSIT OF A COMPLETE SPECIFICATION.

1210.—CHARLES EDWARD HERPST, of 3, Rue Jean Jacques Rousseau, Paris, mechanical engineer, for "*Certain improvements in pumps.*" A communication. May 1, 1865.

NOTICES TO PROCEED.

3145.—CHARLES WYATT ORFORD, of New Street, Birmingham, engineer, for "*A new or improved apparatus for measuring water and other fluids.*" Dec. 19, 1864.

3213.—JOHN WOLSTENHOLME, of Ratcliffe, Lancaster, gas-fitter, for "*An improved implement for cutting pipes and bars of metal.*" Dec. 26, 1864.

5.—JOHN FREDERICK PARKER, of Birmingham, and JOSEPH TARMER, of Birmingham, for "*Improvements in the manufacture of oxygen gas, and in treating and economizing the residual products of the said manufacture.*" Jan. 2, 1865.

596.—WILLIAM RENWICK BOWDITCH, of Wakefield, clerk, for "*An improvement in carburetting gas; also in the preparation of hydrocarbons for carburetting gas; and improved methods of treating alkali which has been used to purify coal oils, shale oils, petroleum, and other mineral oils.*" March 3, 1865.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MAY 1.

The DEWSBURY, BATLEY, AND HECKMONDWIKE WATER; FAREHAM GAS; NEWTOWN WATER; and RASTRICK GAS Bills, were brought from the Commons, read a first time, and referred to the Examiners.

The UNITED GENERAL GAS Bill was referred to a Select Committee, consisting of the Earl Graham (chairman), the Marquis of Tweeddale, Lord Dacre, Lord Sondes, and Lord Wenlock, who will sit on Monday, May 8, at eleven o'clock.

The SHEFFIELD WATER Bill was referred to a Select Committee, consisting of Lord Egerton (chairman), the Earl of Belmore, Lord Rollo, Lord Boyle, and Lord Lovel and Holland, who will sit on Friday, May 5.

A petition was lodged against the DORKING WATER Bill, from the inhabitants of Dorking.

A petition was deposited from the mayor, alderman, &c., of Folkestone, praying to be heard against any alteration in the Folkeston Gas Bill.

TUESDAY, MAY 2.

The BRIERLEY HILL GAS; GALWAY WATER; PRESTON GAS; AND RHYL DISTRICT WATER Bills, were brought from the Commons, read a first time, and referred to the Examiners.

The TYLDESLEY WITH SHAKERLEY LOCAL BOARD, and DORKING WATER Bills, were read a second time, and committed.

The GOMERSAL GAS Bill was reported from the Select Committee, with amendments.

THURSDAY, MAY 4.

The SHEFFIELD WATER Bill.—An intimation was given that the promoters do not intend to proceed further with the Bill this session.

The FOLKESTONE GAS; BATH GAS; GOSPORT GAS; WINCHESTER WATER AND GAS; and BRISTOL WATER Bills, were read a second time, and committed.

The HANLEY GAS and the DUNDEE GAS Bills were referred to a Select Committee, consisting of Earl Romney (chairman), the Earl of Effingham, Lord Bolton, Lord Castlemaine, and Lord Strathspey, who will sit on Monday, May 8, at eleven o'clock.

The UNITED GENERAL GAS Bill.—The order appointing certain lords to consider the Bill was discharged.

The DORKING WATER Bill was referred to a Select Committee, consisting of Lord Llanover (chairman), the Earl of Pomfret, the Earl Vane, Lord Saltersford, and Lord Dartrey, who will sit on Monday, May 8, at eleven o'clock.

A petition was deposited against the BIRMINGHAM WATER Bill, from the Warden and Society of Sutton Coldfield; and against the CHELTENHAM WATER Bill, from the Cheltenham Improvement Commissioners.

FRIDAY, MAY 5.

The GAINSBOROUGH WATER Bill was brought from the Commons, read a first time, and referred to the Examiners.

The WEST WORTHING IMPROVEMENT; BATH GAS; and BRISTOL WATER Bills, were reported, with amendments.

The LITTLEBOROUGH GAS; REDHILL GAS; and SOUTH METROPOLITAN GAS Bills were read a second time, and committed.

The GOMERSAL GAS Bill was read a third time, passed, and sent to the Commons.

Petitions were deposited against the BIRMINGHAM WATER Bill, from the Corporation of Birmingham; against the CARNARVON NEW WATER Bill, from C. Holman and D. M. Allen; against the CHELTENHAM WATER Bill, from owners, &c., of property in Cheltenham, and also one from the inhabitants of Cheltenham, praying to be heard against any alteration in the Bill; against the GLOSSOP WATER Bill, from owners and occupiers of cotton-mills, &c., of Stockport, and E. Potter and others; and against the HORSFORTH WATER Bill, from R. Greville and J. Napper.

MONDAY, MAY 8.

The DUNDEE GAS Bill.—An intimation was given that the promoters would not proceed further with the Bill this session.

The IMPERIAL GAS Bill was brought from the Commons, read a first time, and referred to the Examiners.

The RAMSBOTTOM GAS Bill was returned from the Commons, agreed to.

The GOSPORT GAS Bill was reported, with amendments.

The REDHILL GAS; SOUTH METROPOLITAN GAS; and FOLKESTONE GAS Bills were reported, without amendment.

The BANBURY WATER; CHESTERFIELD WATER AND GAS; HORSFORTH WATER; LUTON WATER; ST. ALBANS WATER; EXETER GAS (No. 1); and the RUNCORN, WESTON, AND HALTON WATER Bills, were read a second time, and committed.

The OSWESTRY LOCAL BOARD Bill was read a third time, and passed.

Petitions were deposited against the DEWSBURY, BATLEY, and HECKMONDWIKE WATER Bill, from the Local Board of Health of Batley; and against the CHELTENHAM WATER Bill, from the inhabitants of Cheltenham.

TUESDAY, MAY 9.

The following Bills received the Royal Assent:—The ROSSENDALE UNION GAS; BRIGHTON, HOVE, AND PRESTON CONSTANT SERVICE WATER; OSWESTRY LOCAL BOARD; and RAMSBOTTOM GAS.

The WINCHESTER WATER and GAS; TYLDESLEY-WITH-SHAKERLEY LOCAL BOARD; CHESTERFIELD WATER AND GAS; and ST. ALBANS WATER Bills, were reported, with amendments.

The BANBURY WATER and the LUTON WATER Bills were reported, without amendment.

The NEATH WATER Bill was read a second time, and committed.

The BATH GAS; WEST WORTHING IMPROVEMENT; and BRISTOL WATER Bills, were read a third time, with the amendments, passed, and sent to the Commons.

A petition was deposited against the IMPERIAL GAS Bill from the National Society for promoting the Education of the Poor.

A petition was deposited against alteration in the DEWSBURY, BATLEY, and HECKMONDWIKE WATER Bill, from the Manchester, Sheffield, and Lincolnshire Railway Company.

THURSDAY, MAY 11.

The committee on the DORKING WATER Bill reported that it is not expedient to proceed further with the Bill.

The RUNCORN, WESTON, AND HALTON WATER Bill was reported, with amendments.

The DEWSBURY, BATLEY, AND HECKMONDWIKE WATER; FAREHAM GAS; CARNARVON NEW WATER; GLOSSOP WATER; LLANELLY LOCAL BOARD OF HEALTH; and RASTRICK GAS Bills, were read a second time, and committed.

The REDHILL GAS; SOUTH METROPOLITAN GAS; and FOLKESTONE GAS Bills, were read a third time, and passed.

The ROSS IMPROVEMENT Bill and the UNITED GENERAL GAS Bill were referred to a Select Committee, consisting of Lord Monteagle (chairman), Lord Seymour, Lord Sherborne, Lord Dunsany, and Lord Truro, who will sit on Monday, May 15, at eleven o'clock.

A petition was deposited against the IMPERIAL GAS Bill, from the Fulham District Board of Works.

A petition was deposited against alteration in the IMPERIAL GAS Bill, from the Vestry of St. Marylebone.

IMPERIAL GAS BILL.—The BISHOP of LONDON: My lords, I rise for the purpose of calling attention to the proposed addition to the Imperial Gas Company's works in the immediate neighbourhood of the National Society's Training Schools at Chelsea. I have been entrusted with three petitions to present to your lordships on the subject of a private bill now before the House for the extension of the works of this company. One of these petitions is from the parishioners of Fulham, another from the Guardians of the Poor of Fulham, and the third from the National Society's Training School at Chelsea. In one of them the petitioners pray to be heard by counsel against the bill, and in the other two they express a desire to have their case stated to your lordships in this House. It appears that the object of the Imperial Gas Company in promoting the present bill in Parliament is to obtain power whereby they will be enabled greatly to increase the works at present in operation in the neighbourhood of the National Society's Training Schools. The bill has already passed through the other House of Parliament without any opposition being raised to it, or the attention of Parliament being particularly directed to it; but that arose, as I have been given to understand, from some mistake on the part of those who received the notices of opposition from the Board of Health and the vestry of the parish of Fulham. The petitioners in this case feel that they have a very serious grievance to bring before your lordships. It appears that the works of the Imperial Gas Company have now been in operation for some years to a limited extent, and even during the time when the extent of their operation has thus been limited the most serious mischief has arisen both to life and property in the neighbourhood, so much so that legal proceedings were not long since resorted to in order to secure a mitigation of the evils which were complained of. Mr. Broadbent, a market gardener in the neighbourhood, so long ago as 1856, finding his property seriously injured, took legal proceedings against the company. Upon that occasion it was alleged and proved that property which a short time before was sold for £150 had been so much injured that it has since been disposed of for £20. In the course of that case certain medical authorities were examined, and they stated what in their opinion was likely to be the effect of the great nuisance complained of in the parish. It appears that the clergy and others, resident in the neighbourhood, presented a memorial to the Chelsea Vestry in 1856, when the mischief was much less than at present, and their statement then made as to the effect of this nuisance was as follows:—"Most serious injury to health and property. At all times we are exposed to the risk of breathing an air impregnated with gas, which is allowed to escape and to contaminate the atmosphere. Almost every night the discharge of fœtid matter from the works of the manufactory causes to many of us a painful difficulty of breathing, disturbed sleep, nausea, and headache." When the medical authorities were examined, it was stated that among the effects produced were "extreme lassitude and depression of spirits, frightful nightmare, dreams, nausea, and sickness in the morning; loss of appetite, inaptitude for business, a filthy stench, as if some indescribable nastiness were being constantly inhaled. In the morning (for it is during the night that the exhala-

tions are most active) the air is often evidently saturated with impurity, and even the curtains and hangings in bedchambers are described as being, in some states of the wind, covered with a filthy gaseous slime." The highest medical authorities have given strong testimony as to the injurious effects of these works. Among others, Dr. Taylor, the eminent professor of chemistry and medial jurisprudence, gave evidence to the effect that, in the manufacture of gas, "ammoniacal gas, sulphurous acid, sulphuretted hydrogen, or hydrosulphuric acid gas, coally and tarry matter, soot, and carbon are evolved. Sulphuretted hydrogen is a most offensive and nauseous gas, and creates a sickening and nauseous smell. It is liable to be evolved in the manufacture of gas, and so affect the health of those living in the vicinity." The result of the law proceedings was that for a time, under the authority of the courts, the evils were mitigated. But the evils complained of at that time arose when the gas-works were not one-tenth of the size to which they are now proposed to be extended, and therefere if the bill now before your lordships House is to pass into law, the evils I have recapitulated, and which are borne testimony to by the highest medical authorities, will be aggravated tenfold. The petitioners in this case have some little doubt how to proceed, inasmuch as the bill to which they object is what is called a private bill, but there is no doubt that it carries with it very important public interests. Even if it were private interests only that were affected, I am quite sure that your lordships would be anxious that no injustice should be done. But the fact is that the bill is fairly described as a bill for destroying health and property in the parishes of Chelsea and Fulham. Being interested in the parish of Fulham, and residing there for six months in the year, it might be supposed that I have been induced from private grounds to bring this question forward; but I can assure your lordships that I have not been in the slightest degree actuated by private considerations, because, much as property would be injured in the parish, it would not be difficult to sell it and purchase a commodious residence at a distance from these dangerous and offensive works. But the property I refer to really belongs to the Church, and it would be a serious matter, even as regards the estate vested in the see of London, if that property should become materially deteriorated. At present this is a neighbourhood in which a great amount of building is going on, but if these evils are to be increased tenfold it is not likely that houses of a superior class will continue to be erected. It is not, therefore, merely from private considerations that I feel disposed to urge upon your lordships not to assent to a bill which, among other things, will destroy a neighbourhood which has been historical now for 800 years. Besides those connected with the see of London who are interested in the matter, I may state that Mr. Veitch, the well-known and enterprising florist, whose greenhouses and nurseries adjoin the works of the Imperial Gas Company, has invested upwards of £40,000 in buildings and plants, and he is, therefore, naturally in a state of great alarm lest his property should be ruined, which would be the case if the proposed bill is allowed to pass into an Act. Your lordships have always been anxious to prevent evils of this description arising from the emission of noxious gases. Only a year or two ago a bill was passed into an Act for restraining the nuisances arising from alkali-works, and I believe that those living in the neighbourhood of such works have received considerable benefit from the passing of that Act. But, of course, it would be a much easier process to prevent this great evil than to provide a remedy for it after it has been allowed to originate. It is quite true that if the air and atmosphere of these two parishes are destroyed, it is open for those who sustain an injury to bring an action against the gas company; but I think it is a much more easy process not to allow these monster works to be erected in the metropolis than to bring actions against the company when the works have been established. One of the arguments which are not uncommonly used in committees on private bills of this nature is, that when works of this kind are once established it becomes a matter of delicacy to prevent their extension. But it is the extension of the works which produces the evil, and renders it intolerable. Gas-works may be no nuisance at all, but gas-works that are to cover 150 acres, and which are to pour into the stream of the Thames, which Parliament is endeavouring to cleanse, noxious and filthy gases, and all the refuse from the works, certainly become a public nuisance, and require that public attention should be directed to them. One particular body, occupying premises in the neighbourhood of which it is proposed to erect or extend these works, is the National Training Society, who have schools there. Now, the National Society's Training School, I am instructed to say, educates at this moment about 611 boys. That, I believe is the number now on the register, and of that number there are more than 500 scholars in daily attendance. It may be said that as they are only day scholars they are only exposed to these noxious influences for a limited period during the day. But there are, besides 103 students, the future schoolmasters of the country, who are compelled to pass both day and night in this neighbourhood. The prayer of the managers of the training school is that your lordships should interpose to prevent that which must be delcterious to the health of the inmates of the establishment. I hold in my hand a certificate from the medical officer of St. Mark's Taining School, declaring that the inmates have for some time suffered from the annoyance and inconvenience of the noxious effluvium arising from the gas-works closely adjoining the college. In that certificate he says:—"Should this nuisance be continued or increase, I am fearful that it will be very detrimental to the health of its inmates. I have seen very lately a case of illness produced by the inhalation of gaseous emanations, causing headache, feverishness, and relaxed throat, with general debility." Besides the danger likely to arise to health, it is a matter of importance in a pecuniary sense. The sum of £46,986 has been expended in purchasing the site and erecting the buildings of the training institution. Of that sum the Committee of Council of Education has from public sources expended a sum of £8925, and all the rest has been raised by the National Society and its friends. The petitioners, therefore, humbly pray your lordships not to allow this bill to pass, and should it unfortunately pass through committee, they are even bold enough to hope that a motion will be made in your lordships House to throw out the bill upon a third reading, and to prevent what they believe would be a public injury and evil being inflicted upon the metropolis."

The petitions having been ordered to be laid upon the table,

Lord RAVENSWORTH said: My lords, I also have been entrusted with a petition against this most obnoxious bill, the objects of which have been accurately and with great propriety explained by the right reverend prelate who has just addressed your lordships. The petition in question is from the vicar, churchwardens, and overseers of the parish of Fulham, who complain that a considerable number of the residents of the parish will have no alternative but to leave the parish if this bill passes. Perhaps a nuisance of this kind is more a question of degree than almost any other that can be mentioned. Gas-works to a certain extent may be comparatively innocuous, but when they are to be extended in the enormous degree proposed by this bill, and when retorts of unheard-of magnitude are to be erected, and when the most serious injury is likely to arise in the pollution of the water of the Thames, it is only natural, considering that this is an improving neighbourhood, and that it contains a large number of respectable and even handsome houses, that the inhabitants should look to Parliament for protection. The extension of these works must inevitably inflict great injury upon the rest of the district. The case of Mr. Broadbent, the market gardener, has been referred to by the right reverend prelate, and I believe that if this bill passes his property will be rendered almost worthless. The property of many other persons will be injured in a similar manner; and, under all the circumstances of the case, I must be allowed to express a hope that the representations of the right rev. prelate will be listened to with attention, and that if the public grievance is really so great, your lordships will refuse to pass the bill. Unless otherwise advised, I shall certainly feel disposed, upon the second reading of this so-called private bill, to move its absolute rejection; and I believe I shall be able to show public grounds quite adequate to justify such a departure from the usual practice of your lordships House. It may be urged that the bill ought to have been opposed in the other House of Parliament. I believe that it would have been opposed there if it had not been from peculiar circumstances arising from the indisposition of the vestry-clerk of the district, who at that moment was incapacitated from business, and had no opportunity of appearing by counsel against the bill as he ought to have done. The question, my lords, is one of a serious and important character, and I shall certainly endeavour to induce your lordships to reject the bill upon the second reading.

The petition was ordered to lie on the table, and the subject then dropped.

FRIDAY, MAY 12.

The HANLEY GAS BILL.—The committee reported that the promoters will not proceed further with this Bill.

The FAREHAM GAS BILL was reported, without amendment.

The RASTRICK GAS and the EXETER GAS (No. 1) Bills were reported, with amendments.

The GALWAY WATER; PRESTON GAS; and BRIERLEY HILL GAS Bills, were read a second time, and committed.

The BANBURY WATER; LUTON WATER; WINCHESTER WATER AND GAS; CHESTERFIELD WATER AND GAS; ST. ALBANS WATER; and TYLDESLEY-WITH-SHAKERLEY LOCAL BOARD Bills, were read a third time, and passed.

HOUSE OF COMMONS.

MONDAY, MAY 1.

The BRIERLEY HILL GAS; GALWAY WATER; KIDDERMINSTER, STOURPORT, AND BEWDLEY WATER; PRESTON GAS; and RHYL DISTRICT WATER Bills, were read a third time, and passed.

A message was received from the Lords to the effect that they had agreed to the BRIGHTON, HOVE, and PRESTON CONSTANT SERVICE WATER Bill without amendment, and to the CRYSTAL PALACE DISTRICT GAS Bill with an amendment.

The WATER-WORKS Bill was read a second time, and committed to a Select Committee.

TUESDAY, MAY 2.

The DRIGHLINGTON AND GILDERSOME GAS Bill, as amended, was considered, and ordered to be read a third time.

IMPERIAL GAS COMPANY.—On the motion for receiving the report of this bill,

Mr. H. LEWIS, who had given notice of an amendment said: I beg to propose an amendment, the object of which is to obtain a revision of the rates of charge for gas after fifteen years, provided the profits of the concern then appear to exceed a certain sum. I ought to state that the proposal should have been made in the committee on the bill; but an omission has arisen in that respect, and the only relief that can now be had is to bring forward the proposition in the House. The proposition is one which in itself seems perfectly fair for the company, and is certainly not more than the consumers of gas in this metropolis are entitled to. I beg to move the adoption of the amendment, which will have the effect of regulating the price of gas to the public after the termination of the present contract.

The SPEAKER having put the question,

Mr. STANILAND: Sir, I am sorry to be obliged to oppose the motion of my honourable friend. What is the object of that amendment? It is neither more nor less than this—to ask the House to decide what the price of gas shall be. My honourable friend has been candid enough to state that the proposal ought to have been submitted to the select committee on the bill; but that was omitted to be done. I apprehend that, on his own showing, my honourable friend has no case to submit to the house, and I think, in now bringing forward such a proposal, he takes a very unusual course. Had the question been submitted to the committee, they would, I have no doubt, have fairly considered it on the evidence that would have been adduced in its support; but it is now too late. The house, has in fact, no means before it of adjudicating such a question.

Mr. DODSON: I have no hesitation in saying that this amendment ought not to be agreed to. The proposal is to empower the House, having no evidence before them, to take on themselves to regulate the price of gas in the metropolis. This was a matter for the committee on the bill to decide. The proposal either was made in the committee or it was not. If it was proposed, the committee, having evidence before them, rejected it; and if the committee rejected it on evidence, I am sure the House, not having evidence before it, will not take on itself to reverse the decision of the committee, which was come to after hearing the evidence. If the clause was not proposed in committee, then it is the fault of those who wished now to introduce it that they did not propose it when they had the legitimate opportunity of submitting it to the proper tribunal.

Mr. JACKSON: I must also oppose this amendment. It is no doubt very desirable to obtain the periodical revision of the rates for gas supplied to the consumers in the metropolis, but such a clause cannot be entertained at this stage of the bill. I would suggest to my honourable friend that the proper course would be for the parties to appear before the committee on the bill in another place, and then the question can be properly considered.

The amendment was withdrawn and the report received, and the bill ordered to be read a third time.

The EXMOUTH GAS and the LEAMINGTON GAS Bills were read a second time, and committed.

THURSDAY, MAY 4.

The GAINSBOROUGH WATER Bill was read a third time, and passed.

The BELFAST GAS; the SOUTHAMPTON GAS; and the RAMSBOTTOM GAS Bills, were reported.

FRIDAY, MAY 5.

The IMPERIAL GAS Bill was read a third time, and passed.

MONDAY, MAY 8.

The RAMSBOTTOM GAS Bill was read a third time, and passed.
The AYR WATER Bill was read a second time, and committed.

TUESDAY, MAY 9.

The CRAYS GAS and the RIPON LOCAL BOARD Bills were reported.
The GLASGOW CORPORATION WATER Bill was read a third time, and passed.
The BELFAST GAS Bill, as amended, was considered, and ordered to be read a third time.
The LIVERPOOL UNITED GAS Bill was referred to a Select Committee, consisting of Mr. Stansfeld (chairman), Lord Stanhope, Mr. Morrison, and Mr. J. R. Yorke, who will sit on Tuesday, May 16, at twelve o'clock.

WEDNESDAY, MAY 10.

The GOMERSAL GAS Bill was read a first time, and referred to the Examiners.

THURSDAY, MAY 11.

The EXMOUTH GAS Bill was reported without amendment, and ordered to be read a third time.
The WATER-WORKS Bill was referred to a Select Committee, consisting of Mr. Roebuck, Mr. Scholefield, Mr. Ferrand, Mr. W. E. Forster, Sir John Ogilvy, Sir Edward Grogan, Mr. Caird, Mr. Smollett, Lord Richard Grosvenor, Mr. Hibbert, Mr. Beecroft, Mr. John Tollemache, Mr. Rendall, Mr. Milner Gibson, and Mr. Dawson Damer.

FRIDAY, MAY 12.

The BELFAST GAS Bill was read a third time, and passed.
The SOUTHAMPTON GAS and the WEST BROMWICH IMPROVEMENT Bills, as amended, were considered, and ordered to be read a third time.
The MANCHESTER CORPORATION WATER and the BELFAST WATER Bills were reported.

HOUSE OF LORDS.

(*Before the Earl of* ROMNEY, *Chairman; the Earl of* EFFINGHAM, *Lord* BOLTON, *Lord* CASTLEMAINE, *and Lord* STRATHSPIE.)

HANLEY GAS BILL.

MONDAY, MAY 8.

Mr. RODWELL, Q.C., Mr. HORACE LLOYD, and Mr. CHITTY, appeared for the promoters; Mr. BURKE, Q.C., Mr. O'MALLEY, Q.C., and Mr. WYLLYS MACKESON for the British Gaslight Company, and owners of property, &c., in Hanley; Mr. LOCH for the Burslem and Tunstall Gas Company and the Burslem Local Board of Health, petitioners against the bill. A petition had been presented by the Staffordshire Potteries Water-Works Company, but no appearance was entered upon it.

Mr. RODWELL said he had the honour to appear in this case, with his learned friends, on the part of the Hanley Gas Consumers Campany, Limited, and he would endeavour as shortly as he could to state the grounds upon which that company sought the authority of Parliament on the present occasion. The object of the bill now before their lordships was to supply with gas certain districts in the Staffordshire Potteries, which were mentioned in clause 4 of the bill. But the principal point to which their lordships attention would be directed would have reference to the supply of gas within the municipal borough of Hanley, which was the largest town in the Potteries, containing a population of nearly 40,000, and rapidly increasing in numbers and importance. The borough of Hanley was at present supplied with gas by the British Gas Company, who were the principal opponents in the inquiry now to take place before the committee. He did not know whether he need trouble their lordships by going at any length into the question of the supply of gas to Hanley previous to the year 1858; but if any question should arise upon the part of the petitioners, he would refer to it hereafter. At the present moment he would content himself by stating that in the year 1858, by the Staffordshire Potteries Act, the district of Hanley was assigned to the British Gas Company; the district of Longton to the Stoke, Fenton, and Longton Gas Company; and the district of Burslem to the Burslem and Tunstall Gas Company. These districting arrangements were the result of some negotiations when the bill was before the House of Commons, and which ended in a compromise to the effect which he had just stated. In the present bill the promoters sought only for powers to light the borough of Hanley, because, although from the diagrams exhibited it would appear that they included the town of Burslem within their area, they did not, in fact, propose to supply gas in that town, but only to lay their mains through a part of the township for the purpose at some future time of supplying Smallthorn and Norton-in-the-Moors. The two last-named places had been assigned to the Tunstall Company, but they had not as yet been lighted by them, and it was urged upon the promoters that in projecting this scheme it was desirable that they should take powers to provide for any future contingency which might arise and put themselves in a position to supply gas to these two places. He did not, however, think that the committee would hear much about this part of the case, and therefore he would not further allude to it. He felt that he should best discharge his duty and the more readily put the case before their lordships, if he proceeded to read at once the petition of the chief opponents of the scheme, the British Gas Company. It was a petition of most frightful length, but a great deal of it was mere recital, which no doubt was very interesting to the residents of Hanley, but he did not think was a subject to which their lordships would attach any importance whatever. He would therefore select such portions only as he thought necessary to dwell upon, and his learned friends on the other side could use the other parts of the petition as they pleased. It was, in fact, an account of the various contests in which the company had been engaged, both before and after 1858. The petitioners began by stating who they were, and then proceeded to recite that they had expended a large capital in the erection of works and laying down mains and pipes for the supply of the district. They then referred to something which occurred in the year 1837, upon which he did not propose to say a word. They then proceeded to state that since the year 1858, they had had the exclusive supply of the borough and they were still the only company supplying gas there; that their works contained every modern improvement, and were amply sufficient to meet the present demand for gas, and any increased demand which might arise in the future. Upon that allegation, he would remark that the promoters of the present bill would be able to establish, upon undoubted evidence, that even although the British Gas Company might have all the modern improvements and appliances of which they boasted, the inhabitants of Hanley had, until within a very recent period, a very bad supply of gas, which was charged at a very high rate indeed. The petition stated that by the Act of 1858 the British Gas Company were brought under the provisions of the Gas-Works Clauses Act, which was a General Act for the regulation of gas companies, and was incorporated in their special Act. But when he told the committee that the maximum price this company were entitled to charge was 5s. per 1000, and that they had been actually charging their consumers as much as 4s. 6d. until within a comparatively recent period, he thought they would feel that the consumers and public of Hanley generally had good cause of complaint in this respect. The petition proceeded to state what took place before the select committee in 1858 with reference to the arrangement of districts, and on this point he would only say that it appeared that the effect of the compromise then made was that the British Gas Company having the largest district had set the price to all the other companies. So long as the British Gas Company had kept up the price of gas at Hanley, there being no competition, the other companies had regulated their prices accordingly; so that not only had the consumers of Hanley been suffering, but their neighbours also had suffered with them. The petition further stated that since the powers conferred upon them by the Act of 1858, they had well and efficiently supplied the borough, and townships and parishes included in their area, with gas of an illuminating power exceeding the parliamentary requirement, and at prices below those specified in the Act, and that they had not been in a position to receive the dividend they were entitled to, and that they had been unable to form any reserve-fund. Now, the promoters distinctly denied the truth of the first part of this allegation, and would prove, on the clearest evidence, that the company had not "well and efficiently" lighted the district. It might be true that they had not actually divided 10 per cent. upon their capital invested in these works; but the people of Hanley felt that the company had been making very enormous profits at their expense, and that they were not justified in the charges they had made to the consumers. The petitioners then made some allegation about their being occupiers of buildings, &c., in Hanley, for which they were rated; but the meaning of that paragraph in the petition, or why it was introduced at all, he was at a loss to explain. Because they were assessed on their property to the local rates did not seem to him to be any reason why they should continue to charge a high price for gas of a bad quality. The petition then proceeded to give an account of the formation of the company whose bill was now before the committee, in these terms: "That on the 16th July 1864 a company was incorporated under the Companies Act 1862 by the name of the Hanley Gas Consumers Company Limited for the purposes of erecting and maintaining gas-works and of selling and supplying gas within the said borough of Hanley but no works have yet been executed by the said company. That a bill has been introduced into and is now pending in your right honourable House entituled 'An Act for conferring powers on the Hanley Gas Consumers Company Limited and for other purposes.' That the objects of the said bill are to enable the said Hanley Gas Consumers Company Limited hereinafter called the said Hanley Company to erect and maintain gas-works in the said borough of Hanley for the purpose of manufacturing gas and of supplying and selling gas in the said borough and in the said parish of Norton-in-the-Moors in competition with and in opposition to your petitioners." Now he (Mr. Rodwell) did not disguise the fact that that which had brought the promoters of this bill before Parliament, was the monopoly which the old company had enjoyed for so long to their exclusive benefit. It was said that they were desirious of coming into competition with the existing company, and so they were, but it would be a very wholesome competition; and the persons who now sought to introduce it were the persons who themselves would be consumers of the gas. But he would also add this, that with the large population of Hanley, and the number of houses at present unlighted with gas, there was ample scope for the operations of each company. It would be shown in evidence that a considerable number of persons had been prevented taking gas on account of the high price which the British Company had been in the habit of charging, and that these persons would gladly avail themselves of a supply upon the terms set forth in the present bill. The object of the bill, therefore, was not merely for the purpose of competition and underselling the promoters, but for the purpose of supplying gas as it were to a district unoccupied by the existing gas company. The next paragraph in the petition was a peculiar one; it was verbally true, but the inference it was intended to suggest was something quite otherwise: "That the said borough of Hanley is now well and efficiently supplied with gas of good quality and at a very low price by your petitioners under the powers of their said Act and the gas-works of your petitioners are sufficient to meet any demand for gas which can arise within the said borough of Hanley and parish of Norton-in-the-Moors." The committee would observe in this paragraph the word "now." It was perfectly true that "now"—*i.e.*, since the latter end of 1864—the price of gas was low, the charge being 3s. 6d. per 1000 cubic feet; but then he should inform the committee that in the early part of last year, it got noised abroad in Hanley that a consumers company was being formed, and a pressure was thus put upon the British Gas Company by the parties interested in that undertaking, who said, "If you do not reduce the price you will give a handle to this new company." They accordingly made a reduction from 4s. 6d. to 4s. 3d. The new company was registered in July 1864, and no sooner was that done than the old company reduced their price to 4s., although on the occasion of the former reduction they had stated that they could make no further concession, and that 4s. 3d. was the lowest price at which gas could be possibly sold. At the same time also they made a reduction in the charge for the public lights. In November 1864 when the parliamentary notices for this bill were given, the British Company made a still further reduction, bringing their price down to 3s. 6d., so that ever since the agitation for the new company was set on foot, they had been reducing their charges which had previously been very exorbitant, and thus it was that they were able to come before Parliament and say that the borough of Hanley was "now" supplied with gas "at a very low price." But it was equally true that until the new company was started they charged as much as they could, and it was with the greatest reluctance, and only at the last moment, they brought their price down to 3s. 6d. Meetings of course were held, and general attention called to the subject, the universal expression of the feeling of the inhabitants being that they had been unfairly dealt with by the British Company, and at the same time there was a strong desire expressed in favour of the present scheme. It was not only with reference to the private consumers, but also with reference to the public lamps that dissatisfaction with the existing state of things was manifested. It appeared that the British Company had

been in the habit of supplying the public lamps on a contract for the year, but the year consisted only of eight months, and out of every month except December and January, they had a kind of perquisite of five nights when there was a moon. He should be in a position to prove that in 1856, the local authorities of the town found, upon investigating the subject, that the exception made in reference to these two months had not been complied with by the company for a great many years, and in the result the company refunded a sum of £150 on this account. The committee would hardly be surprised that the new gas company was taken great interest in by the people of Hanley. It was promoted by persons having property in the town, and being resident there; whereas the British Company were strangers to the district. Their head-quarters were in London, and they carried on their business at Hanley through agents; and he was informed that of the whole of the inhabitants of the town only three were shareholders in that company. They had works at other places in England, the whole of which were managed by a board sitting in London, who, of course, could not attend to the complaints of the consumers, or promote the interests of the public so efficiently as it would be done by a company whose proprietary were resident on the spot. The only persons in Hanley who were connected with the company appeared to be two of the aldermen of the borough and the town-clerk, who was also their solicitor. It would seem as though the policy of the company in the past had been to charge the maximum rate for gas, and give the minimum amount of light, and he supposed they found that it answered their purpose to do so. In proof of this, he held in his hand a document which showed that of 1365 houses, 1145 were without gas, showing that the company had never endeavoured to tempt persons, by charging a moderate rate, to avail themselves of the comfort and convenience which a supply of gas afforded. The petition went on to state "that the proposed erection of additional works for the supply of gas in the said borough of Hanley, and the proposed supply of gas to the said borough by the said company as intended by the said bill of the said Hanley Company is quite unnecessary, would be an useless and wasteful expenditure of capital, would occasion serious and unnecessary inconvenience and danger to the inhabitants of the said borough, and would be most injurious to your petitioners without being of any benefit to the inhabitants of the said borough or to the public, and would be an unnecessary interference with the arrangements hereinbefore stated which met with the approval and were sanctioned by Parliament, and in accordance with which your petitioners were forced to retire from and abandon extensive towns and districts then supplied by your petitioners with gas, and to sell at a great sacrifice very valuable property then held by them in such towns and districts." There was an allegation in this petition that a bargain was made with Parliament in 1858, and a compromise entered into with other parties that they should have other districts, while the British Gas Company retained Hanley. Now he apprehended that the bargain was equally made at the same time that they should supply it efficiently, and that failing in that Parliament would review its decision, and not consider that it was irrevocably bound by what was done in 1858. The persons whom he would call in support of the present case would state to the committee that they were not before Parliament when the British Gas Company entered into the alleged arrangement, and were no parties to the compromise made on that occasion. (The learned counsel referred at some length to the steps taken in reference to the formation of the new company, which were afterwards proved by the promoters witnesses.) The British Gas Company took great credit to themselves for the various reductions made in the price of gas; but the promoters of the present scheme, as representing the people of Hanley, felt there was no guarantee, should the bill be rejected, that the former price of gas to the public would not be reimposed, and seeing that they had now come to Parliament for powers to compete with the British Gas Company, they were convinced that they could not expect much consideration at their hands. It was clear that only under great pressure the reduction had been made, and it appeared equally clear that unless some controlling power could be exercised over the old company, the consumers of Hanley would always have the same cause of complaint that they had before the new company was originated. The maximum price proposed by the present bill was 3s. per 1000, and in order to enlist as many consumers as possible on the side of the new company, the value of the shares was fixed at £1 each. But the noble lord who presided over the committees of their lordships House, considered that this was a departure from a recognized principle of Parliament, and the shares had now been raised to the value of £10. That would involve the reincorporation of the company under the Joint-Stock Act, but this could easily be done supposing that the committee passed the bill. It was further alleged in the petition, "That the capital of the said Hanley Company already subscribed for is wholly insufficient for the erection of the proposed gas-works and for providing and laying of mains and pipes of the said Hanley Company for the supply and for efficiently supplying with gas the said borough and parish." In reply to this allegation, he would call engineers of eminence who would state that there was nothing in this objection. They would also state as the result of their calculations, that the works would be fairly remunerative—not perhaps so much so as to pay 10 per cent. dividends, but still sufficiently so to yield a good return upon the capital invested. If the British Gas Company could make a large dividend out of the limited sale they had in Hanley, there appeared no reason why a local company, having among its shareholders a large number of consumers, and offering the facilities which this company were prepared to offer, should not be able to realize a satisfactory return, especially as they found that the local companies at Tunstall, Longton, and other places in the neighbourhood, were making good profits. It was urged by the petitioners that the new company would create an unnecessary interference with the streets and roads of the town, and be a great nuisance to the inhabitants. The answer to that was that those who had charge of the roads and streets did not appear to oppose the scheme. In fact he believed the local authorities of Hanley were in favour of it, and looked forward to the introduction of the new company as a thing very much to be desired. He had omitted to mention anything about the public lamps, and perhaps it was not needful he should go into any details upon the subject. He would only say that the town had never been efficiently lighted, and witnesses would state that this was owing to the fact that the high prices charged for gas deterred the local authorities from obtaining that amount of light which they ought to have. After referring to some other circumstances in connexion with the history of the new company, the learned counsel said the parties who promoted it had come forward advisedly, not for the purpose of being bought off, or anything else than to supply the town with gas. But this did take place: before they came to Parliament, overtures were made to them by the British Gas Company. The promoters stated that they had no power in their bill to enable them to do it, but if the British Company pleased they would buy them up, take their plant, and supply the town with gas. They also stated that if they could have security there would be a permanent reduction in the price of gas; they would hand over their scheme to the British Company on payment of the expenses to which they had been put. But the scheme itself was not started for the purpose of being handed over to the old company, but for the purpose of getting good gas at a low price.

Mr. O'MALLEY asked the chairman to take a note of his learned friend's remark, that overtures had been made to the promoters by the British Gas Company. It might become very important hereafter, as a matter of honour, to show that nothing of the kind had taken place.

Mr. RODWELL said the only object of the statement was to do away with the impression that the parties who promoted the bill had any idea of being bought off, and he thought the British Gas Company might have interpreted something which had taken place as evincing a desire to sell to them. He desired it to be understood that until the price of gas in Hanley was reduced to 3s. 6d. as the result of the agitation created by the new company, there had never been any other object on the part of the promoters than to secure for the inhabitants a cheap supply of gas.

Mr. O'MALLEY said the statement was that the British Gas Company desired to buy them off. That was not the case, but on the contrary negotiations were set on foot on the other side to buy off the opposition of that company.

Mr. RODWELL said, with reference to the petition of the owners and occupiers, he should object to the *locus standi* of the petitioners on the ground that they were, according to the practice of Parliament, represented by the municipal authorities of the borough. He should not take a similar objection to the petition of the Burslam Gas Company, because the promoters certainly sought powers to lay their pipes and interfere with the roads of that town. But he believed it would be proved that no injury was likely to accrue to the Burslam Company thereby, and as they would not at all interfere with the supply of gas there, it would be abundantly shown that the alleged grievance of the petitioners was altogether illusory.

Mr. *Joseph Clementson*, examined by Mr. LLOYD.

I am one of the principal earthenware manufacturers in Hanley, and have resided there for 52 years. I am a justice of the peace of the borough, and chairman of the Hanley Gas Consumers Company, Limited, who are the promoters of this bill. I have two manufactories in the town, and employ nearly 500 hands. The population of Hanley at the present moment is nearly 40,000. It is the largest of the pottery towns of North Staffordshire. In the year 1857 it was consituted a borough under the Municipal Act. Before that time it was managed by a body of about 60 commissioners, with a chief bailiff and chairman. I was myself chief bailiff and chairman for three years. My recollection of the British Gas Company goes back to that time. That company is a London company, having offices in the metropolis, and very little local connexion with Hanley. I believe they have only three shareholders in the town. When I was chairman, and during the time I was a commissioner, we were constantly in communication with that company on the subject of the public lighting. We were not by any means satisfied, either as to the quality or the price of gas supplied by them. We used to contract for the lighting of the public lamps for three years at a time. Our last contract was made in 1856, and it run out in 1859. During the continuation of that contract we discovered that we were not having all the lamps lighted that we ought to have. Our contract was for lighting the lamps during eight months in the year, every night during the months of December and January, but excluding five moonlight nights of each of the other six months. We discovered that the company, although bound to light every night in January and December, had omitted to do so during the five nights nearest to the full moon for the space of 14 years. We made a claim in respect of that omission, which was ultimately settled for £150. That was not an adequate sum by any means, but it was the best we could do, under the circumstances, to bring the matter to a conclusion. After that period the company had to deal with the Town Council. As an inhabitant of Hanley, I am myself a consumer of gas. I have about 60 burners in my two factories. I have not considered the supply of gas satisfactory. The price has always seemed excessive to the inhabitants, who have from time to time made applications to get it reduced.

The CHAIRMAN: You speak of a matter that is within your own knowledge.

Mr. O'MALLEY: I will test him by-and-by as to who they are.

The CHAIRMAN: But that all takes up time.

Examination continued: Previous to the formation of our company, the quality of the gas supplied by the British Company was very unsatisfactory. I have never heard that they declined to supply fittings, nor do I know that they ever offered to do so at a rental.

By the COMMITTEE: As far as my knowledge goes I do not know that they have ever been asked.

By Mr. LLOYD: If gas were reduced to a reasonable rate of charge, and was of good quality, I have no doubt there would be a great augmentation of the consumption in my own factories. I am in a position to say that my workmen generally, the major part of whom reside in the borough, are wishful to take it to the extent of 300 lights. Other manufactories would take them in the same proportion, according to their size. A great deal of our work is piece-work, and the workmen who undertake that find their own light. It is for them to determine whether they will have candles or gas. They would prefer gas if it could be supplied at a reasonable charge. Under present circumstances they prefer candles. I think there is plenty of room in Hanley for a new company. The number of public lamps in the borough is insufficient for the proper lighting of the roads; there ought to be at least double the quantity. There is no question that the high price charged by the gas company has kept the number so small. The new company was first projected in September, 1864. I took shares in it at the commencement. It might have been in July. I signed the original memorandum of association. My reasons for becoming a promoter of the company were numerous; the principal reasons were these: I was conscious that we had been very imperfectly supplied with gas for many years, and I was equally conscious that the workmen generally, not only at my own manufactory, but in others, were exceedingly desirous to use gas instead of candles, provided it could be brought down to something like 3s. per 1000. I thought also that the shareholders in the gas company should be persons residing in the neighbourhood, who would be able to watch the movements of their servants, and see that the town was supplied with good gas, and that if there were any advantages to be derived from the supply of gas the consumers were the best entitled to those advantages. It was not only in the interest of the gas consumers of the town that I joined the company, but, as I have just stated, we require double the number of public lamps sufficiently to light the borough of Hanley. We have a vast number of manufactories, and the smoke from them is ascending in volumes day and night all the year round, so that when the atmosphere is heavy the smoke is beaten down, and we can scarcely see many yards before us. It requires

an additional amount of light from this consideration. Besides that, it is essentially necessary to enable the police efficiently to discharge their duties during the night. I took £500 worth of shares in the new company, which I still hold, and I was the first permanent chairman of the company. The price charged by the British Company when our company was formed was 4s. 3d. per 1000 feet. It had been reduced to that price only a short time previously. Since then further reductions have been made. I remember a public meeting which was held at Hanley on the 7th December last. The mayor was in the chair. I was present at the meeting. There were resolutions in favour of the company unanimously passed. To the best of my recollection there would be 400 persons in attendance; but the night was extremely boisterous, and the heavy rain was pouring down every moment, or else without doubt there would have been a much larger attendance. I have here a report of the meeting, and the resolutions passed are as follows:—"That the charges made by the British Gaslight Company, Limited, for the supply of gas, as well to private consumers as to the public lamps in this borough, are and always have been unreasonably high, and that the quality of the gas is also very unsatisfactory; and this meeting is of opinion that whilst the announcement of a reduction to private consumers is an admission that previous charges were excessive, it is made merely to thwart the well-intended efforts of the gas consumers own company, recently formed to meet the requirements of the inhabitants." There was also another resolution:—"That the terms on which the Hanley Gas Consumers Company, Limited, have offered to supply the borough with gas entitle that company to the support of all the inhabitants, and this meeting pledges itself to exert all the means at its command to promote its success." This last resolution was in reference to a written proposal made by the Hanley Consumers Company. There was a meeting of that company on the 14th of November, 1864, at the town-hall, when the directors made a report to the shareholders, in which this paragraph appeared:—"Your directors are anxious to avoid the expense of a parliamentary contest, although they believe that any attempt on the part of the British Gas Company to oppose your bill in Parliament will prove unsuccessful. They are, therefore, prepared either to purchase the works of the existing company at a fair valuation, and proceed with the bill in Parliament, to secure the town all the benefits of the arrangement, or to withdraw, if the British Gas Company will bind themselves to adopt the price, quality, and principles of your company and pay the costs incurred." It is quite correct we were willing to retire upon the terms mentioned in the report. The proceedings of that meeting were published in the local newspapers and circulated, and some thousands of those slips of paper were printed and sent to different parts of the borough. After our company was formed, reductions were made by the British Gas Company in the price they had previously charged, but we have no security that the price will not be again raised if our company does not persevere. As far as I can gather the general wish of the inhabitants, they would prefer that this company should obtain an Act of Parliament; the next best thing, in their opinion, would be, that if the old British Gas Company, as we designate them, were willing to sell their plant at a reasonable price, we should buy it; and thirdly, if nothing better can be done, if they will bring down their price to something like 3s. per 1000 cubic feet, and give us a better and more regular supply, with a purer gas, and pay our expenses, we are willing to retire. Hanley and Tunstall are the only places in North Staffordshire, I believe, in which there is not a local company; and several other places, Burslem, for example, and Stoke, Fenton, and Longton, which have now local companies, were formerly lighted by this very company, which has had to retire from them in favour of the local companies.

Cross-examined by Mr. O'MALLEY: I have been one of the active promoters of this measure. I was first applied to to become so by Mr. Stevenson and Mr. Blakiston, who are the solicitors for this bill. I had been previously impressed with the necessity of such an undertaking. When they applied to me I do not remember their mentioning any communication they had had from Mr. Hedley. To the best of my belief, the first time I saw Mr. Hedley was at one of our meetings at the town-hall. I was not previously introduced to him. I do not recollect that I was. If I was, I had little, if any, conversation with him. I do not remember any, nor do I remember the circumstance of being introduced to him. I did not know, when Mr. Stevenson and Mr. Blakiston first applied to me, that Mr. Hedley had suggested the formation of a company, and had offered to get several friends in London to support it. I learned that fact, if my memory serves me correctly, at one of the meetings at the town-hall. I will not say that Mr. Hedley undertook, if we got up the company, that he would get friends to supply a portion of the capital. I heard Mr. Hedley say, at one of the meetings at the town-hall—but I do not remember the exact date—that it was indispensable that there should be local shareholders to the amount of at least £15,000; but I do not remember that Mr. Hedley undertook to get a portion of the capital amongst his friends in London. At the public meeting which I spoke of, the mayor was the first speaker. Mr. Blakiston and Mr. Stevenson also spoke. Mr. Hedley was one of the speakers, but I will not say the great speaker. Mr. Hedley is one of the engineers of the company. He may be one of the consulting engineers of it for anything I know; but I believe there is more than one engineer. I have read our prospectus. According to the best of my information and knowledge, he is published as consulting engineer of our company, but I understood we had more than one consulting engineer. It was part of our arrangements that he should be consulting engineer to the company. Before 1857, when the company paid the £150, there had been complaints made. The arrangement between the Lighting Commissioners and the company was that in the months of December and January the lamps were to be lighted every night. I do not remember that during the 14 years, we, as the lighting body, had ever complained that the lamps were not lighted during those nights; but we had complaints coming into us from all quarters of the borough affecting those three nights—generally, complaints every week personally. I do not remember that we ever called the attention of the company to their omissions in this respect. I cannot speak to any complaint ever having emanated from our body to the corporation on that subject. I complained myself 13 years ago very frequently to the gas company with regard to the irregular supply and the bad quality of the gas.

The CHAIRMAN: That has nothing to do with it. You are injuring your case by not answering the questions directly. You were asked, with reference to this particular case did you, or not ever complain, with reference to the omission on those certain nights, that you were not supplied with lights during the whole of the contract.

Witness: I have before said I do not recollect personally making these complaints. I did not attend the commissioners so regularly in after years as I did when I was chief bailiff.

Cross-examination continued: The books of the old commissioners, I should say, had a very great many complaints on record, but I cannot speak particularly about this time. It was when the contract was at an end that it was discovered that the company, by their contract, ought to have lighted on those nights, and they gave us £150 as compensation for not having done so. I did not make a speech at the public meeting, but only uttered a few words. You can denominate it a speech if you please. I was the first speaker after the chairman. I believe that I did say, "if we can have an unmistakable assurance that gas can be supplied at 3s. 3d. per 1000 cubic feet—as good, recollect, as the gas supplied for the last 30 or 40 years." I did make that remark, but according to the best of my recollection I named 3s., not 3s. 3d.; but you are only giving part of what I said, and part is unintelligible unless you have the whole.

Mr. O'MALLEY: If you like to give the whole speech to their lordships you can. I am afraid I should have the court empty before I was finished.

Cross-examination continued: I have personally complained of the quality of the gas to almost every superintendent for the last 30 years occasionally, though I cannot speak to dates. I can say within a year, but as to the precise date, or even the months, I cannot say. Within a year of July, 1864, I complained to Mr. Haswell, at my own works. I think I met with him in the road several times, or it might be in the neighbourhood of my own manufactories. When I was chief bailiff I sent complaints without number to the directors in London. There should be a book kept at the office of the company for complaints, but I never looked to see if there was one nor entered a complaint in it; but complaints were made, as will be found as this investigation goes on. The commissioners were all of opinion that the gas was of inferior quality. I never took any means to have it tested. I am aware that under the company's Act the corporation had the right to appoint an inspector for the purpose of inspecting and testing the quality of the gas; but I cannot remember that they ever appointed such a person. I do not remember ever having personally made an application to the corporation to appoint such an officer. I am not a member of the corporation. I was chairman of the commissioners, but I cannot say positively that I ever in that capacity got that body to require their clerk to make a complaint to the company as to the badness of the gas, or anything about the gas, but to the best of my judgment we did. In my manufactories the men all work piece-work, and supply their own light. I believe it would be possible to have the gas supplied in such a manner as to register against each individual the quantity consumed by him in respect of his work. I believe the men are anxious to have it supplied in their own homes, but I am sure that if it could be furnished at a cheap rate it would be used by the men in my manufactories instead of using candles. In that case each man must be charged according to the amount of consumption in the ratio that the whole body is charged. I have given my opinion that there ought to be double the number of public lamps. I am aware that the corporation have it in their power to supply any number of public lamps they may think necessary for the lighting of the borough. They have not done so, and I think they have been neglectful of their duty in that respect. I was not aware that the corporation had the power, if they were dissatisfied with the proceedings of this company, to do what Parliament is asked to do here, namely, to give the authority to break up all the streets for the purpose of putting down pipes. I am aware that by their own Act they could have given to this company if they pleased the right of breaking up the streets. There is an Act already in existence to transfer that power to the New Gas Consumers Company. I did not apply to the corporation to exercise that power on behalf of our company. The company might have made such an application, but I did not myself.

A MEMBER of the COMMITTEE: Were you ever present at a meeting where the company determined to do so, because what the company *might* do is a very vague thing?

Witness: I have not a distinct recollection of it.

Cross-examination continued: In our original bill the maximum price was 3s. 4d., but in the amended bill, I understand, it is reduced to 3s. The only reason I can give for that alteration is, that is was thought and believed that 3s. would be a sufficiently remunerative price. The alteration was not caused by the existing company reducing their price to 3s. 6d., and by our desire to underbid them. I cannot speak particularly as to the alteration which has been made in the new bill relative to the maximum dividend. At the meetings which have been held credit has been taken for making the shares £1, so as to allow the workmen to be shareholders in the company. I believe that there are 323 shareholders who hold less than 10 shares each. It is information for me to be told that by the amended clauses it is proposed that all those shareholders who have subscribed for less than 10 shares are to have their money returned after the Act is passed. Of course the effect of that would be to strike these 323 shareholders off the list altogether. If the bill is so altered, I should consider it contrary to the provisions upon which we originally started.

Mr. CHITTY: The bill has been so altered in conformity with the requirements of Lord Redesdale.

Cross-examination continued: We were incorporated in July, 1864. I cannot tell how many £1 shares had been taken to the 1st of September; the secretary will give the committee that information. I was not aware that the Lighting Committee of the commissioners had recommended and ordered additional lamps to be put up. It may be correct, but it has not come to my ears. I believe that the Town Council have entered into a contract with the existing company for lighting the streets for a year. The price agreed on is 3s. 6d. I am not aware that the company have offered to the corporation to guarantee that the price shall never be raised above 3s. 6d. Personally I have no choice as to whether this company is established as a rival company to the old one or not. As I before said, all we want is cheap gas, and the company brought under legal obligations to supply at 3s. per 1000 cubic feet; and if no better can be done, the present company are willing to retire if the old company can be brought under legal obligations to do that and pay us our expenses. I no not know the amount of the charges of the solicitors and the consulting engineers, but, I have no doubt the engineers charges will be the largest. I think all our expenses should be paid, and properly so, because the gas would never have been reduced if we had not sprung into existence. The site we have selected is close to the other side of the canal, just opposite the works of the existing company; it is considered a very eligible one. We have not exactly bought it. I mean by that expression that we have paid a certain amount provisionally. I think we are not bound if our bill is thrown out, but Mr. Forbes will answer that question better than I can. I suppose that our pipes are to go through the town side by side with the pipes of the existing company. I dare say there are seven miles of mains through the Potteries from north to south, but I do not know how many miles of mains in Hanley and Tunstall; there may be 23, but I do not know. I am aware that the soil of the borough of Hanley is peculiarly liable to dislocation, but I cannot speak particularly on the subject. In some instances they build, in point of fact, upon the old slags where the clay has been got out. There are mines under the town, and seams of both coal and iron. There is a tendency of the

houses and streets to subside. By this bill we propose that there should be power for two companies to be opening the streets for the purpose of stopping leakages, and all that kind of thing in the borough of Hanley. Mr. Hedley was not at the meeting of shareholders at the town-hall, at which I presided; the first meeting Mr. Hedley attended was the one at which the mayor presided. I remember the meeting at which I presided. It was, I believe, on a Tuesday evening, and Mr. Hedley was not there; at any rate I do not recollect him. [Paper shown witness.] Yes, Mr. Hedley appears to have been at this meeting, but, I said "to the best of my judgment." I did not know he was there. I have no recollection of Mr. Hedley, at that meeting, saying that he would engage to find amongst some friends of his in London, one-half of the capital of the company, as soon as the other half was subscribed in the town.

Cross-examined by Mr. LOCH: I am the chairman of this company and we propose to supply gas within the borough of Hanley, and the township or district of Norton-in-the-Moors. To reach this last-named place, we must, I understand, pass over some portion of the parish of Burslem; I, however, cannot speak to what amount we pass over, or whether any or not, but evidence will be given on this point. I cannot charge my memory with it; if I could, I have quite candour enough to tell you the truth. If we pass through the township of Burslem, we shall have to pass through a district subject to the jurisdiction of the Burslem Local Board of Health, who have the management of the roads and streets in their district. I do not know that the British Gas Company supplies Norton-in-the-Moors with gas at the present time. I do not think that town is lighted with gas; if it is so, it is beyond the reach of my recollection. I do not know the fact. I know that the Burslem and Tunstall Gas Company supply the parish of Burslem with gas, and that they have mains in that parish. We do take power under the 8th clause of our Act "to break up and otherwise interfere with any streets, roads, bridges, ways, and places, and interfere with any sewers, drains, water-pipes, and gas-pipes respectively within those limits, and for the purpose of supplying gas within the limits of this Act—Norton-in-the-Moors being one of those limits—but, not otherwise, the company may from time to time exercise all, or any of the powers conferred on them by this section within the parish of Burslem." I dare say that gives us the power to break up the streets and interfere with the gas-pipes within the parish of Burslem, but I understood that the question had been adjusted. Those gas-pipes must be the gas-pipes of the Tunstall and Burslem Gas Company I suppose; but I understood that the question had been adjusted. If I am mistaken in the correctness of that, that is another matter, there will be some evidence with respect to the supply of gas to the town of Norton-in-the-Moors.

Re-examined by Mr. CHITTY: I believe this to be a perfectly *bonâ fide* honest gas consumers company. There is no truth in the suggestion that this company was got up by Mr. Hedley. The origin of the company has been from a conviction of the enormous charges, and of the necessity that has existed of altering the enormous charges which have been made by the British Gas Company for the consumption of gas. The town has been for many years under the impression of the necessity that something should be done. Years ago we thought and talked about the necessity of getting up a company. While I was chief bailiff there were a great many complaints about the badness of the gas supplied to the consumers. I made many myself. There were certain books containing minutes of our proceedings. These books are now in the hands of the corporation. I have no control over them therefore. I recognize the book produced by the handwriting; it is the rough draft of the proceedings which took place before the commissioners. The book will speak for itself. I do not remember whether the commissioners ever appointed any one to test the gas. I am not aware that the Act under which they had the power to do so was passed in 1858. My memory does not serve me to say if there was any Act that gave us any power to test the gas of the British Company whilst the commissioners were in existence. The proposal to reduce the price of the gas from 3s. 4d. to 3s. was in consequence of Lord Redesdale striking out the 41st clause, which proposed a sliding scale, giving the company the right to take a higher dividend in proportion to the reduction they made in the price of gas. I believe the price up to a recent date for supplying the public lights for eight months in the year, omitting five moonlight nights, was 60s. 6d. I never heard of any accidents occurring from the dislocation of the soil. There may possibly have been one; but to the best of my recollection I never heard of any, nor do I know anything about it. If there had been such a thing it would be exceedingly strange if it did not come to my knowledge.

Mr. *Thomas Chappell Brown Westhead*, examined by Mr. CHITTY.

I am a director in the proposed company, and, with my partners, hold £500 worth of shares. I am a justice of the peace for the county of Stafford, and a member of the firm of Westhead, Moore, and Co., earthenware manufacturers, at Hanley. We employ between 700 and 800 hands. I joined this company because I saw the necessity for the introduction of cheaper gas, and as a manufacturer, if cheaper gas could be got, I could employ it in the place of employing candles, which I do now in many instances. The gas that has been supplied—I do not mean now, but before this company was set on foot—was not of a good quality. I believe that the gas they are now supplying is better than it was before we started the new company. I attribute the rise in the quality to the fact that since we started the new company we have tested the gas. The price, in my opinion, has been excessive—I mean the first price, 4s. 6d. To my knowledge the workmen in my employ take an active interest in promoting this company; a good number of them are shareholders, and also undertake to consume the gas. I consider that the proposal of the company to supply fittings at a rental would be peculiarly beneficial to the town, because the various holders of cottage property will introduce it themselves; they will hire the fittings from the company, and so introduce it to the tenants, and charge them a rental upon their consumption. In some cases, I have no doubt, the tenants would do this themselves. In my own manufactory, if the gas were supplied at a more reasonable rate and of good quality, I could take a very great deal more than I do at present. I think it could be arranged with my workmen to charge them with the gas consumed at the manufactory, either by a small meter in each room, or at so much per head according to the time. There might be some little difficulty at first, but that would soon be got over. At present the workmen use candles to a great extent. In my opinion it is not a satisfactory state of things that the gas supply to so large a borough as Hanley should be entirely under the control of a London board. In that opinion others in the town concur. I should say the best thing to do, and the most economical, would be for us to purchase the British Company's works, if they would sell them.

Cross-examined by Mr. O'MALLEY: I subscribed for 100 shares in my own name, and 100 in the name of my partner. I believe, it was increased to 500, but I do not recollect the exact date. My partner was away from home, and I had to wait till he returned to take the other shares, but I fancy there were more than 200 taken before the 8th of March: 100 in September, 1864, and 100 in November, 1864, is correct, the other 300 must have been taken since the 8th of March. The rooms in my manufactory are of different sizes: some have six men at work, in them, some 10, 12, and 14, and so on; sometimes only two or three. The consumption, per head, could be ascertained, if you chose to put a meter to each light. I mean to say it could be done, undoubtedly. I do not know that sooner or later, if we introduced gas, the cost would fall upon the manufacturer; it would be the manufacturer's own fault if he allowed it. No doubt it would have to be deducted from the men's wages. I am not aware at all what the value of the fittings is; that is a matter I have not gone into. No doubt, in a large factory like mine, it would be very great, but in a cottage it would not be much. I have not found fittings very perishable commodities. I cannot say, but I should think, 7½ per cent. would remunerate any man for the cost of fittings. I do not know how many years, upon an average, these fittings last, but they last a long time. I should be very much suprised to hear that they do not last seven years on an average, because I have had them last more than 15 years. The gas-pipes I have in my works have been laid down from the commencement, some have been repaired, but very few of them. I have been there 10 years, but I took the concern from a party who had been there before. I say that the quality of the gas supplied is bad, but I cannot say when I first discovered that fact. It has been tested since this company was formed, and has been proved to be below the mark. I suppose it would be Mr. Forbes who tested it, but I do not know. I have seen the machine by which it was tested, but I do not know to whom it belongs. I have seen the testing, but I do not know who applied the testing machine. I saw the boy who was working the thing; there were two or three of the directors present. There was no engineer present that I know of, except it was Mr. Forbes. Mr. Hedley, I think, was not there. The testing took place some time in January last. I suppose it was for the purpose of getting up evidence for these proceedings. I suppose so, I cannot say. It was after the company had been brought out, and the application to Parliament made. I should say that was the only practical proof that I ever had. I was not aware till to-day, that there is a complaint-book at the office of the company. I never made any formal complaint to the company, or addressed them any letter, or memorial, or anything of the kind complaining of the quality of the gas. I never heard, till to day, that 323 of the smallest shareholders are to be struck out of this company. I cannot say whether such a proceeding would be consistent with the principles of the bill, because I do not know why they should be struck out at all.

Re-examined by Mr. CHITTY: It is no proposal of the company's to strike out the 323 small shareholders. I never heard of it till I heard of it in this room to-day. Should the expense of supplying the manufactories eventually fall on the masters, I as a master am willing to undertake it. I do not know what the rental of a meter for one light would be per annum calculated at 7½ per cent. upon the cost price, but supposing it did not amount to more than 1s. it would not be a very heavy tax, either upon the workman or the masters. The company does not, I believe, propose to make a profit upon the supply of gas-fittings at 7½ per cent.; but they will quite clear themselves at that rate, and I have no doubt they would get customers to them for supplying fittings upon those terms.

Mr. *William Livesley*, examined by Mr. CHITTY.

I am the senior partner in the firm of Livesley, Powell, and Co., china and earthenware manufacturers, at Hanley. We employ about 400 hands. I have resided in Hanley all my life. My partner, Mr. Powell, is a member of the Town Council. During 1863, and prior to that time, there was general dissatisfaction prevailing in Hanley with reference to the gas supplied by the British Company. Our company grew out of that dissatisfaction. I believe there would have been much more gas consumed in the town of Hanley in the years previous to 1863 if the price had been lower than it was. I consider the price of 4s. 6d. per 1000 cubic feet excessive, and I believe that feeling is universal, or nearly so. I attach great importance to the proposal to supply gas-fittings at a rental. I believe it will secure a much larger consumption of gas. It will lead to its general introduction into the manufactories; perhaps in the manufactories it will lead to a fourfold consumption at least. I do not consider that there would be any difficulty in making arrangements with the men in reference to the consumption of gas in the manufactories, because we tried the experiment. We have lately added 56 new lights to our manufactory, and we called the workmen together, and asked them to test the time a candle would burn. We asked them also what they would pay for one or two hours consumption of gas; and the workmen found, on testing the burning of a candle, that they were willing to pay a certain price for every night and every morning, using the gas at their option. That being the case, we entered into a calculation ourselves, and we found that it would pay us and would pay also for the outlay of plant—that was, the fittings and meters. The thing was perfectly easy and satisfactory. I should propose one meter for a certain number of lights—say for 50 or 100 lights. I speak from the fact that we have lately tried the experiment, and the thing is perfectly easy and accomplishable. I am a director of the new company, and became so from the conviction that a new company ought to exist. I consider that the borough of Hanley is entitled to have a local company, because of its size and growing importance. I am not satisfied at being ruled by a foreign body, and only feel astonished we have stood it so long.

Mr. *George Sargeant*, examined by Mr. CHITTY.

I am one of the directors of the company whose bill is now before the committee. I hold £200 worth of shares. I was a member of the Town Council until last November, and acted on the Lighting Committee for several years. During that time there were many negotiations with the British Company for obtaining additional lighting for the public lamps. The price paid was 4s. 6d., I believe, but I am not sure about that. They are not supplied at per 1000.

Mr. MACKESON: Then 4s. 6d. is a mistake.

Witness: Yes, for public lamps.

Examination continued: I was elected mayor of Hanley in November 1863. Shortly afterwards the council memorialized the British Gas Company, complaining of the insufficiency of the reduction they had just made. The memorial was in these terms:—

To the Directors of the British Gaslight Company, Limited.

The Memorial of the Mayor, Aldermen, and Burgesses of the Borough of Hanley, sheweth—

That your memorialists, as representing the interests of the public of the borough of Hanley, have been frequently requested to communicate with your company, complaining of the high price charged for gas consumed by private consumers within the borough, and to endeavour to obtain a reduction thereof.

That your memorialists, in consequence, feel it now their duty to acquaint you with the complaints of the inhabitants on this subject. That, although your company lately lowered the rate of charge from 4s. 6d. to 4s. 3d. per 1000 cubic feet of gas, that reduction, although evincing a desire on the part of the company to consult to some extent the wishes of the inhabitants, was felt to be insufficient, and is, indeed, scarcely appreciable.

That your memorialists learn that many towns in England, not more favourably situated than Hanley, either as regards the facility for the supply of coals, or in other respects, obtain their supply of gas at a much less rate per 1000 cubic feet than that charged in Hanley; and that some of those towns are even supplied by your own company at considerably less than the rate your company charges here.

That, in the opinion of your memorialists, it would be for the real interests of your company to make a reduction in their rate of charges for gas in this borough, and place this town in such respect on as good a footing as the other towns referred to; for, were the rate of charges put more fully within the reach of the general public, the consumption of gas would be so considerably increased as speedily to compensate your company for making the reduction.

Wherefore, your memorialists request that some material reduction may take place in the price charged by your company for the supply of gas to private consumers in the borough of Hanley, or that such other remedy for the grievance complained of may be applied as to your honourable company may seem fit.

This memorial was adopted on the 8th of January, 1864. The reply which the corporation received, on the 20th of January, was as follows:—

To the Mayor, Aldermen, and Burgesses of the Borough of Hanley.

Gentlemen,—I am desired to acknowledge the receipt of your memorial of the 8th inst., complaining, on the part of the private consumers within the borough of Hanley, of the high price charged for gas, and seeking to obtain a further reduction thereof. The directors regret very much to find that the reduction from 4s. 6d. to 4s. 3d. per 1000 cubic feet, announced to take place from the 1st inst., is felt to be insufficient and scarcely appreciable by the inhabitants, especially as it was made without any solicitation, and in the absence of any complaint as to the price. The directors feel assured that, if the price now charged be compared with any neighbouring town similarly positioned to Hanley, it will be found that it is moderate, taking into consideration the quantity of gas consumed, the amount of business over so large an area, and the great loss constantly sustained in the distribution of the gas by the mining operations of the Duchy of Lancaster and others, peculiar to the district, from which the directors have no power to protect themselves, and in case of which they have no control.

With reference to the lower prices being charged in other towns supplied with gas by this company than Hanley, the profits received from those towns have more nearly approximated to the interest sanctioned by Parliament on the capital therein employed. In fact, in one of the towns, a portion of the reserve-fund, over and beyond the maximum parliamentary profit, was realized before any reduction in price was made; whereas at the Potteries, for the fifth year, ending the 30th of June last, the profit had been £6000 less that the company were entitled to under the Act. But in the face of such unfavourable circumstances the directors have made, unsolicited, a reduction, with the view of showing to the inhabitants that they wished to act liberally, and in the hope that a corresponding increase in the use of gas, especially by the manufacturers, would speedily reimburse them for their present loss. It is therefore with some surprise that they learn that the reduction thus made has not been appreciated by the private consumers. The directors feel confident, from their experience in such matters, that they are manufacturing gas on the most approved principle, and with the greatest economy, and that their plant in the Potteries is both ample and efficient in every respect; and, had the consumption of gas at this station increased in the same ratio as at their other towns, the price would have been the same in all. The absence of the general use of gas in the extensive manufactories in the Potteries prevents any fair comparison with other towns where the manufactories are lighted with gas from the basement to the attic.

In order, however, to show in every possible way their desire to meet the requirements of their consumers, and more especially the wishes of the mayor and corporation of the borough, the directors will make a further reduction in the price at the close of the year, should the profits realized warrant them in so doing. This reservation is the more necessary, as by the last reports the price of coal, iron, &c., was quoted as considerably advanced.—I have the honour to be, gentlemen,

FREDERICK L. LINGING, Secretary.

At the time the reduction of 3d. was made, it was urged over and over again that the Town Council should undertake the supply of gas; but I do not know whether at that time the likelihood of their being another company was known or not. Since that time there have been several reductions in the price of gas, but in my opinion they have been extorted from the company by fear of opposition. There is a petition from Hanley in favour of the bill, signed by over 6000 persons.

Cross-examined by Mr. MACKESON: I do not remember that there was any other complaint in the memorial except as to the price. I cannot say if the first reduction in price was made without solicitation by the company. I do not know whether the company made a further reduction at the end of the year. I have only a general recollection of it. Some deductions certainly were made, but I cannot remember whether they were made at the close of the year or not. I did send an answer to that last letter, dated Jan. 21, 1864:—

Dear Sir,—The answer of the British Gas Company to the memorial from this council was read at a council meeting held this morning. I am requested to acknowledge its receipt with thanks. The council regret that the company cannot at once place them under the same rate of charge as other towns, but they trust that the partial promise held out to them may be realized at the close of the year.

Cross-examined by Mr. LOCH: I have lived in Hanley a long time, and know the country very well. To supply Norton-in-the-Moors you would have to pass through the parish of Burslem, and so along the roads kept in order by the Burslem Local Board; but the Hanley people are excessively surprised at the Burslem people offering any opposition, because all the surrounding districts would receive the benefit of the reduction made in the price of gas. I am surprised to find Mr. Challoner instructing the opponents of this bill; he is solicitor to the British Gas Company, to the corporation, and also to the local board. It is proposed to take the same route to Norton-in-the-Moors as is taken by the British Gas Company.

Mr. *Francis Davis*, examined by Mr. CHITTY.

I am a land agent and valuer at Hanley, and have resided there for 40 years. I have been a commissioner under the Lighting Acts. I am aware that the Lighting Committee have made frequent complaints to the British Gas Company. I do not know if they were in writing. I am an extensive owner of house property in Hanley, many of which are cottages let at rentals from £5. 10s. to £8. None of these are at present supplied with gas. I should be very glad to have them supplied with gas if it could be supplied at 3s. per 1000, which I am informed can be. I should be glad to pay so much per quarter, or per week, and charge it to the tenants the same as I do for water. I pay for the water-rent, and I might as well pay for the gas. I have not had the gas supplied because of the price. The fittings must be put in by the landlord, and I am sure they would take them of the company at a rental.

Cross-examined by Mr. MACKESON: I have not put fittings to these cottages because I have no gas to put in. I could not get gas without I paid an enormous rent for it. I think it would pay me if I got gas at 3s., but I do not think it would at 3s. 6d.; at 3s. I could supply a cottage house at a less price than they pay for candles, and give them a better light. I have lived in Hanley nearly 40 years. I have frequently complained to the company about the bad gas supplied, but not in writing. When I have seen the manager, or any of the men belonging to the gas-works, I have said to them, "My gas is very bad." I have never made a complaint in writing of any kind.

Cross-examined by Mr. LOCH: The class of cottage to which I have referred would cost about £80 to £100 to build. I think the gas-fittings for such a house would cost about £2. I say I would not venture to go to that expense while the gas is at 4s. 6d. I am aware of a recent reduction by the British Gas Company to 3s. 6d., but it was not made till they were under the pressure of a new company coming, so we do not thank them for making it. I consider that it does make a difference to me what was the motive for the reduction, because I think it a great question whether they would keep the price down to that unless they were bound to do so. I do not say that I would not put fittings to my labourers cottages if the gas was 3s. 6d. per 1000 feet, but I should be very foolish to do so with gas from the old company at 3s. 6d. if the new company offered to do it at 3s.

Mr. *Thomas Mills*, examined by Mr. CHITTY.

I am the secretary to the Hanley Gas Consumers Company. I am a native of Hanley, and resided there for the first 20 years of my life. The next 29 years I was a Methodist preacher. I have been accustomed to make observations on the illuminating powers of gas in different towns and in Hanley. I observed that the flames of the gas burning in Hanley were yellow and dull. They gave a dull light with small illuminating power. I consider the quality decidedly bad. I considered the price, viz., 4s. 6d., to be unreasonably and unwisely high. I also thought the price for the public lamps, 60s. 6d. for eight months, too high. I was present at the public meeting at the town-hall on the 15th of July; the mayor was in the chair, and the meeting was attended by a number of influential inhabitants of the borough. Several resolutions were passed. I have no copy of them, but I recollect the substance of three of them. One was, that it was expedient and necessary to institute a new company in the town, with a view to effect a great gas reform; another was, that steps should be taken to have the new company registered under the Joint-Stock Companies Act; and the third was the appointment of a committee to carry out the two former resolutions. There was a subsequent meeting. There was a handbill distributed by the British Gas Company in the shops, and given to all parties as they entered the town-hall. It was a handbill in favour of the old monopoly, to the following effect:—

THE GAS QUESTION.

Notes and Queries addressed to the Burgesses of the Borough of Hanley.

How is it that those gas companies in this neighbourhood, such as Stoke, Burslem, Newcastle, and Stafford, who have local capital and shareholders, as the new company purposes, have never been lower in the price of gas than the British Gas Company? If the British Gas Company have been such extortionists as the new people say, how is it accounted for that at the present time the price of gas at Stafford is 5s. per 1000, Burslem 4s. 6d., Newcastle 4s. 3d., and at Hanley only 4s., and next month will only be 3s. 6d.? It is stated that the British Gas Company supply gas of only 8-candle standard, and yet the persons who say this well know that it is of a much higher illuminating power; and this the authorities of Hanley have the power of proving under the Gas Company's Act. Indeed, it is well known to all disinterested persons that no gas company dare, in these days, to generate gas of only 8-candle power. It is a light that would only make darkness visible, and would not be tolerated. The Burslem and Stoke Companies, like the British Gas Company, have a parliamentary standard of 10 candles; but it is equally well known that the three companies have always given a very superior gas to that standard. The population of Hanley being 35,000, and giving five inhabitants to each house, making 7000 houses. Can the new company really expect to realize the great benefit which they talk of by their prospectuses? Of course they do not. Another thing is well known, too—namely, that competition always ends in amalgamation, as, for instance, at Sheffield; or in districting, as in London, in the case of the Surrey Consumers Gas Company, with which Mr. Hedley was connected. If the British Gas Company, as is the fact, have never realized more than 8 per cent. on the £43,000 of capital invested in the Potteries, which includes the large works, mains, &c., for the lighting of Tunstall, Norton-in-the-Moors, &c., is it likely that two companies, with an aggregate capital exceeding £60,000 for the borough of Hanley alone, can exist with benefit to those who find the capital, and will not the increased capital ultimately tend to enhance the price of gas to the private consumers, as in the cases of the Commercial, Great Central, and Surrey Consumers Companies in London? All the benefits offered by the new company can be obtained from the British Gas Company, both in fitting up manufactories and supplying gas both for public and private consumption. The new company take credit for the reductions that have been made; but the British Gas Company, on reducing the price of gas on 1st of January last to 4s. 3d. per 1000 cubic feet, publicly promised a further reduction in January next, on certain conditions; and, finding those conditions earlier fulfilled, they anticipated the period by reducing the price at once. Are the people of Hanley so simple as to allow a few interested persons to whoedle them out of their money, that they may spend it in a parliamentary contest, in which they well know they cannot succeed?

A GAS CONSUMER.

Hanley, 6th December, 1864.

The object of the circular was to create distrust amongst the inhabitants, as to the success of the new company. No one attended the meeting on behalf of the British Gas Company, for which we were very sorry, as we wished to hear the matter discussed. The resolutions, condemning the British Company, and in favour of the New Company, were carried unanimously. I did not count the number of persons present at that meeting, but I considered the attendance surprisingly good for so dismal a night, it being dark and excessively wet. To the best of my belief there may have been between 300 and 400 persons present; the local papers said 400. The following is the requisition upon which the meeting was called:—

To the Worshipful the Mayor of the Borough of Hanley.

We, the undersigned, ratepayers and burgesses of the borough of Hanley, do hereby respectfully request that you will be pleased to convene a public meeting of the inhabitants of the said borough, to consider the advantages offered by the Hanley Gas Consumers Company, Limited, for permanently ensuring to themselves, and all their fellow-townsmen, an abundant supply of cheap and good gas.

It was signed by upwards of 300 persons. At the close of that meeting a working man proposed that a working men's committee should be formed, with a view to assist the directors in canvassing the town to obtain shareholders and customers. We have got undertakings from about 1300 persons to be supplied with our gas. Nearly all the manufacturers in the town have undertaken to burn the gas of the new company, if they obtain parliamentary powers. Some fifteen or sixteen of them have given us the number of lights they now use, amounting to about 700, and the number they would require, if we obtain parliamentary powers to sell at 3s. per 1000, would be increased to about 2400. There are also some manufacturers who do not now use gas in their works at all, and who have never used it, but have given undertakings to burn the gas of the new company, and who would require some 800 or 900 lights. The undertakings extend in large numbers to the tenants of cottage houses. I believe that the company supplying fittings in the manner which has been described, would lead to a consumption of gas among a class of persons who are not supplied at the present time. I believe that not one-third of the houses in the town of Hanley are supplied with gas. I believe there are about 6000 signatures attached to the petition now before their lordships, in favour of the bill. It has been signed by nearly all the manufacturers in the borough, by most of the influential inhabitants, and, in fact, it represents all classes to an enormous extent. There was a petition against the bill presented by the inhabitants of the town. I have seen a copy of that petition, and have conversed with a number of the parties whose names are attached to it. Several persons since signing that petition have taken shares in the new company, and they have expressed their regret that they were ever induced to sign it. One of them has taken 50 shares, and another 100 shares. I think about 15,640 shares have been allotted, or

thereabouts, and we have 602 shareholders; each share represents £1. Not quite all of the shareholders are Hanley people, but the great mass of them are. I should think there may be about £2000 stock subscribed in towns adjacent to the Potteries by parties who have constant intercourse with the borough of Hanley, and perhaps the like amount out of that district. There would not be any truth in the suggestion that this company is got up by any gentlemen in London; it would be absolutely untrue to say that it is got up by Mr. Hedley. I am strongly of opinion that the people of Hanley desire to have this new company.

TUESDAY, MAY 9.

Mr. *Thomas Mills* recalled, and cross-examined by Mr. O'MALLEY.

I was a Methodist preacher, but retired on account of ill health in June, 1863. Since that time I and my son have kept a boot establishment. I was appointed secretary to this company on the 23rd of November, 1864. I have an engagement for six months for £50; but there has been no arrangement as to salary if this bill should pass. My experience about gas has been a growing experience. I directed my attention to gas, not scientifically, but by observing the illuminating power of gas, for about five years before I left the ministry. I never tested gas until this company was formed, and a testing apparatus fixed up. I am aware that the light which the gas gives depends not merely upon the illuminating power, but upon the pressure. I tested the gas for this bill. I am a small shareholder in the company, holding ten shares. As secretary, I attended all the meetings. Mr. Hedley attended the first meeting, but it was not a public one. Mr. Hedley originally subscribed for 100 shares; but he has lately taken 200 more. Several of the directors and shareholders have also taken shares during the last two or three weeks. There are nine directors, and one of them—Mr. Clement Wedgewood—doubled his shares. Mr. Clementson did not double his shares; he added 200 to the 300 he previously held.

Mr. O'MALLEY: We only find upon his own evidence about 200, so I thought he did double them; 400 I thought was twice 200; there were 100 shares he said in respect of some partner of his?

Witness: That is a mistake—I think on your part. Some of the directors have not increased their subscriptions at all; but others did so largely at the same time as Mr. Hedley, and one or two since. For the first few months we made quite as much progress in the way of shares as I anticipated—perhaps a little more. I occasionally write for the *Sentinel*, and previous to the formation of this company I sent a communication on their behalf. Our capital is proposed to be £30,000. I cannot say whether on the 1st of September the number of shares issued amounted to 4424, as I was not secretary at that time; but it is very likely that was the case. It was announced by the directors that the share-list would close on the 1st of September; but we did not expect to close it with a list of 4424 shares. The number of shares at present held by strangers to Hanley is 2427; but I cannot answer as to the number on the 1st of September. We have records of all proceedings of the company before I became secretary; and I have made a return of the number of shareholders in the neighbourhood of Hanley; shares now held in the neighbourhood of Hanley; shares now held by non-residents in Hanley and the neighbourhood. [Witness was cross-examined in reference to several shareholders described as of Gray's Inn Square, Hanley, but who were clerks of Messrs. Hilliard, Dale, and Stretton, solicitors, 3, Gray's Inn Square, London.] A public meeting was held in Hanley, at which a committee of workmen was formed for canvassing for shareholders. No person has received anything in the way of payment; but the directors resolved, in February last, that in their judgment it would be right to remunerate the canvassers who might after that time obtain applications for shares. For every 100 shares they got subscribed for they would receive 10s. The deposit paid was 1s. per £1 share.

Mr. O'MALLEY: Are you aware that by your amended bill 323 of those shareholders, having taken less than ten shares, are to be struck off the share-list of the company?

Witness: The number is 353; but we do not propose to strike them off—we shall give them the option of increasing the number of their shares. A man who has taken a £1 share may increase his shares to £10; or they may sell their shares one to another; but then, of course, they must be struck off the list. The shareholders whose names are on the share-list applied in writing. [Form of application read.] That is all the authority we had for putting them on the share-list. I believe every shareholder, directors included, has signed the share-list. I was not aware that by law and by the general Act upon the subject, they must sign their assent to take the shares in addition to this proposal, before there is authority to put them on the share-list, generally speaking. We have always allotted the number of shares applied for. I suppose we reserved to ourselves power to consider a person a shareholder immediately after that; but I never read the Article of Association.

Re-examined by Mr. RODWELL: I can make a return of the shareholders on the 1st of September, if it is required. I left the reading of the Articles of Association to the legal gentlemen. There has been no promise that, if the company is formed, I am to have the secretaryship. I had been in the habit, in my public preaching, of using notes, and that required a good light. As I had written on gaslight before I came to Hanley, I directed my attention particularly to the gaslight in Hanley, and found it very deficient in illuminating power, and I heard universal complaints about it. I satisfied myself of the quality of the gas by observation.

Mr. *Josiah Mills*, examined by Mr. RODWELL.

I live at Hanley, but do do not follow any business now. I am well acquainted with the town and population. I have made a list of the houses in certain streets which are not supplied with gas, and those which are supplied. [Witness was examined at considerable length in reference to the list, from which it appeared that out of 1365 houses at which inquiries were made, 1145 were not supplied with gas, leaving only 220 that were supplied.] Many of the occupiers of these houses said they would very much like to have the gas, but the owners could not be got in a humour to put it on. Knowing the feeling upon this subject, I think that if this company were started more people would consume gas in Hanley. I believe it is a fact that more people have taken gas there since the price has been reduced than there were before.

Cross-examined by Mr. O'MALLEY: I was employed to make this calculation by my brother, the secretary, and expect to be paid for it. I hold five shares in the company. The houses I spoke of are, for the most part, inhabited by workmen. I cannot say whether they pay their rent weekly, or whether it is a yearly rent, but I think the majority are weekly—some more and some less than 2s. 6d. a week. I do not know which are Irish and which are English. Of course there are Irishmen in all districts. I am aware that the corporation can have public lights wherever they please to order them. We have engaged to have 41 more next year, on account of the lowering of the price of gas in Hanley. They could light many other streets and places besides these.

Mr. O'MALLEY: They might introduce mains, or force the company to introduce mains, by simply calling upon them to light the public streets?

Witness: I am not aware that they can force them.

Mr. O'MALLEY: Did you not tell me they could a moment ago?

Witness: I said they might if they thought proper. I do not know that they are compelled to do it. If the corporation fixes the lamps, the gas proprietors have to say whether it will be worth their while to take the main that far.

Mr. O'MALLEY: No; you are mistaken about that. The corporation can force them whenever they choose to do it.

Witness: I will show you that they cannot. There was a memorial got up by nearly 200 of the inhabitants, asking the Lighting Committee to arrange for two lights to be put up in a thoroughfare leading from one part of the town to another. The reply was that they did not know whether Mr. Haswell or the company would think it worth their while to take the mains across, as there was no other building.

Mr. O'MALLEY: Do you know if any application was made to the company by any of the inhabitants of those houses you speak of?

Witness: I was not aware that that was the proper course. There is a committee appointed to go round the different districts to ascertain where light is most wanted; and, of course, according to their recommendation possibly the company might acquiesce. I cannot tell, of my own knowledge, of any application made to the company for putting lights in any of those streets, but I have advised parties to do so, because I think it is the most sensible course. I am an owner of cottages, and light them with gas myself. The tenants pay me for the fixtures at the rate of 1d. per week. Some of the houses cost me a great deal of money to fit up; but the tenants are well satisfied with the charge, and would willingly pay any company or any landlord who would do the same. Many landlords are not agreeable, because the population of Hanley or the Potteries is very migratory; and if the person living in the house were to put up the fittings he would have to make a sacrifice by selling them. Sometimes, if a new tenant did not wish to have the gas, the fittings would be lost altogether.

By the COMMITTEE: It is much the best way for the landlord to do it. If I were to build 100 houses, I would put gas in them for the comfort and convenience of those who lived in them.

Re-examined by Mr. RODWELL: I do not think the corporation can compel the company to put lamps in the streets.

Mr. RODWELL: I believe you are right. The 17th clause of the British Act of 1858 is: "That the company shall, from time to time, when required by the Local Board of Health for the district of Burslem, and so long as they supply their gas, or by the commissioners acting in the respective districts under the Act, or by the mayor, aldermen, and burgesses of the borough of Hanley, supply gas to all the public lamps for the time being in any streets or parts within the districts under the superintendence of these respective bodies, in which streets or parts of streets the mains of the company are now laid down, or to which they may be hereafter extended." Now, in the case you have spoken of, I understood you to say there are no mains.

Witness: In some instances. There was a request to the Lighting Committee to have lamps put there.

Mr. RODWELL: Now, to carry out a little further with regard to the private consumers, do you find in the 19th section this: "Upon the application of the owner or occupier of any building or premises within 15 yards of any main laid down within the limits of this Act, the company shall supply gas"? Are you aware of that?

Witness: I was not aware of that.

Mr. *Clement Francis Wedgewood*, examined by Mr. CHITTY.

I am a director of the present company, and a member of the firm of Josiah Wedgewood and Sons, of Etruria, Hanley. Our firm has been desirous for some time past of being supplied with gas by the British Company, but have been deterred by the price of fittings, and formerly by the price of gas. I have records of our firm regarding several negotiations, beginning from the year 1835. There are several in which we proposed to take the gas, but the price was too high. It was as high as 10s. in 1855. It has since been reduced to 6s. 8d., then to 6s., and then to 4s. 6d. We employ about 400 hands. We should have no difficulty in making arrangements with our workmen in reference to the introduction of gas. Almost all the piece-workers said they would take it. I am of opinion that the proposed system of supplying fixtures would be a great benefit to the consumers. Light is of great importance in the manufacture and sorting of our ware. Fine work requires a good light, and we do a good deal of fine work. I hold 50 shares in the company, and my father and brother 250, or something like that. We were induced to join the proposed company to get cheaper and better gas and fittings in a more advantageous manner.

Cross-examined by Mr. O'MALLEY: The cost of the fittings in our establishment would depend upon whether the gas was introduced for all the workmen, or only for those we should have to light ourselves. A large proportion of our men work by contract, and therefore it would be no interest to us, without they chose to pay for the gas, to introduce it. The workmen who found their own light were left out of my calculation. About £300 to £350 would be required for fittings for our whole establishment. The company did not, in 1857, to my knowledge offer to lay down fittings for our establishment for £248. An outlay of £300 or £400 would be a serious item in our expenditure. If we could charge the workmen for it, of course it would not be an outlay. I have never calculated the amount we should get from the workmen for the outlay upon the fittings; but 10 per cent., I should think, would pay. It would only be natural for those men who pay for their gas to pay for their fittings as well. If the company would lay down the fittings for 7½ per cent., the piece-workers would get the benefit of the 2½ per cent., and we should get the benefit where there was no piece-work; and this was one of the inducements with us to support the new company. The chief inducement was to cheapen the gas. I think 4s. 6d. too dear, as we found by calculation we could get along as cheap with candles. The British Company are now charging 3s. 6d., but we have not taken the gas, as we are waiting to see if we cannot get it cheaper than that. Our company started at 3s. 4d. as a maximum. I do not remember when they came down to 3s. I do not know whether it was since this bill was deposited; nor do I know who had the arrangement of the price that was to be substituted. I am a director, but have not been at all of their meetings. When I became a proprietor I was satisfied with 3s. 4d., but I should be glad to get it cheaper if I could.

Re-examined by Mr. CHITTY: Our maximum price is 3s. 4d. The British Company reduced theirs to 3s. 6d. on the 1st of January, 1865; and their maximum which ought to be compared with ours is 5s.; so that it is 5s. against 3s. 4d. I believe the company could supply fittings cheaper than we could, and therefore it would be profitable for them to supply at 7½, when we could not do it under 10 per cent. If the company offered to supply us at 7½ we should take the fittings from them, especially as we are

tenants at will, and would have to clear them away if we left the place. We have no gas as present.

Mr. *Benjamin Wright*, examined by Mr. CHITTY.

I am a licensed victualler at Hanley, and went to the Plough inn about five years ago. The house was fitted up with gas-fittings. Its value is about £50 a year. I applied to the company for gas, but was told the tenant I succeeded owed money for some gas, and they would not put it on unless I paid that debt. Afterwards one of their clerks came to me and I was allowed to have the gas by paying a quarter's advance; and I paid 30s. as deposit, which I have never received back, although I have left the Plough. The mains came close to the house. I was nine or ten days without gas.

Cross-examined by Mr. O'MALLEY: The Plough formerly belonged to me. Since then I have sold it.

The CHAIRMAN intimated it was not necessary to cross-examine this witness.

Ralph Stevenson, Esq., examined by Mr. CHITTY.

I am a solicitor in the borough of Hanley, and one of the solicitors of this bill. For thirteen years previous to 1857, I acted as clerk to the commissioners. During that time the public lamps were supplied by the British Company. Applications were repeatedly made by the inhabitants for an increase of supply of gas to the public lamps. The maximum rate the commissioners could raise upon the annual value of the property was 1s. in the pound. I hold in my hand the draft minutes in which complaints were entered before my appointment. They were the original entries made by the clerk at the meetings in his official capacity. The first I find here is under date the 4th of March, 1845:—"Many complaints having been made to Mr. Massey on account of the gas lighting for the last season, and many complaints having been made to the commissioners as to the lamps being lighted too late and extinguished too early, ordered that a particular watch be set upon the lamps, and that in all cases where such complaints shall be proved to exist, an account be taken of the gas thus unconsumed by the commissioners, and that double the value be deducted from the bills of Mr. Massey for the gas, and that notice of this resolution be communicated to Mr. Massey. That the mode of instituting the watch be left to the management of Mr. Rhodes,"—he was the servant of the commissioners. Then I find under date of the 5th of February, 1846, which, I think, was the first meeting that I attended as clerk after my appointment, "That a report having been made that 180 lamps have not been lighted during the past month, a proportionate deduction be made from the balance due to the contractor." On the 10th of June occurs this entry—"A return having been made by the superintendent of police of 284 public lamps not being lighted between the 1st of January, 1851, and the 1st of May, 1852, it was ordered that an allowance of £5 should be claimed from the gas company's account." The next is 12th of August, 1852—"Ordered, that the sum of £349. 5s. 2d. be paid to the gas company in liquidation of their account, and at the same time an intimation be given that no further payment will be made until the allowance of £5 claimed for defective lighting be assented to by the company." Then on September 23rd —"It was stated that more lamps were needful in Dun Street, but as this would require a considerable outlay in laying mains, it was concluded to defer any further additions for the present." Again, on the 20th of October —"The superintendent of police having presented a list of public lamps, either not lighted at all, or insufficiently lighted, between September, 1852, and May, 1853, ordered, that the Lighting Committee be requested to examine the same, and report to a future meeting to what deductions the commissioners are entitled in respect thereof." During this time the company's servants supplied the light and lighting the lamps, the commissioners paying them so much per lamp. The next entry is the 4th of May, 1854—"The Lighting Committee reported that the number of lamps not lighted between September, 1853, and May, 1854, amounted to 151, the deduction in respect of which will not exceed £3; and it being stated that there is a large balance in favour of the gas company, it is considered and resolved that the justice of the case will be met by calling the attention of the company to the omission, and that the claim to deduction be waived." The next entry is the 20th of July, 1854—"The gas company to be apprised that an account is kept at the Police Office of lamps insufficiently lighted, to which their servants may have access at their convenience; and that in future deductions in respect thereof will be insisted on, unless the irregularity be from time to time explained to the satisfaction of the commissioners." The next—I do not know whether it is important—is the 19th of October, 1854—"A deputation attended with an address, signed by a considerable portion of the ratepayers of Eastwood, requesting that the gas-mains might be extended to that village, whereupon it was resolved that the matter be referred to the Lighting Committee, with a request that they report thereon to the next meeting." Then the next is—"An estimate having been submitted by the gas company, stating the total expense of laying the mains and putting up lamps to serve Joiner's Square and the intermediate district to be £222. 6s. 10d., of which the proportion to be paid by the commissioners will be £65. 4s. 6d., ordered, that directions be given to the gas company to proceed with the work with the least possible delay;" and then I think the next is the 17th of January, 1855—"It appearing, from further negotiations with the gas company, that the share of the expense to be borne by the commissioners for completing the supply of gas to Joiner's Square will be £100 instead of £65, ordered, that the resolution of the last meeting for the work to be proceeded with be rescinded;" that was not proceeded with, and that neighbourhood was not supplied with gas that winter. When the consumers required extensions of supply of gas, the company insisted upon the terms of the contract, which contained a clause requiring the commissioners to pay certain proportions. The contract was dated Dec. 3, 1840, but I cannot tell how long it lasted. I cannot remember the proportion the commissioners were bound to pay. I cannot remember the price charged under the contract made in 1857, but I think it would be about £3. 0s. 6d.; and I believe that contract is in existence now. I do not think the new terms are in operation yet. The general substance of the old contracts was—eight months lighting in the year; and five moonlight nights omitted, except in the months of December and January, when they were to be lighted throughout the months; and the price for the whole was 60s. per lamp. With reference to the refunding of the £150, I find, under the date of the 30th of August, 1855—"It being reported that the contract with the gas company expired in September last, and it appearing that there was a balance of £500 owing on the gas account to Midsummer last, ordered, that a sum of £150 be paid to them on account, but without prejudice to the claim of the commissioners to any reduction they may be entitled to with respect to the gas supplied since the expiration of the contract." I thought that touched upon the question of the £150.

Mr. CHITTY: Perhaps you can give me shortly about the £150; did the company at first refuse to make any repayment at all?

Witness: When I had to prepare a fresh contract, not having previously looked at it, I saw the clause which required that they should not supply the gas during the five moonlight nights in the winter, except in December and January, when they were to be supplied throughout the weeks. I made inquiries, and found that it had never been supplied for 14 years. And then, by direction of the commissioners, we made a claim upon them for an allowance; which they met by serving a notice upon us to demand an arbitration for the claim for interest on the moneys that we had from time to time owed them. They substantially rejected the claim by first stating that the terms of the contract had not been observed on our part by paying the money half yearly punctually. It was the duty of the company's servants to light the lamps, and therefore the breach of duty was on their part. I gave them notice of arbitration in respect of defective lighting, and they answered by calling upon us to appoint an arbitrator to ascertain what they were entitled to in respect to the delays in payment of gas-rent from time to time. Afterwards they agreed to give £150, and the corporation, who had just succeded the commissioners, agreed to accept that sum. When any contracts were entered into, a reduction of price was always the subject of correspondence, but the company always said they could not make any concession.

Cross-examined by Mr. O'MALLEY: I was one of the original promoters of this company, with the assistance of Mr. Blakiston. I have no doubt that lamps are frequently blown out during the night, and that sometimes they are imperfectly lighted. Directions were given to the police to watch, and complaints were made of the public lamps not being lighted at all. The British Company got their Act in 1858, but I have not the slightest information that the corporation petitioned against two companies being allowed to work in the same district in their borough. I know it now, but I never heard it at the time. There was no provision in the contract as to paying interest, but we were to pay half yearly. The claim for interest was quite a new claim. All dealings between us and the company were carried on by contract. I reside on the boundaries of Burslem and Hanley. I should not think the Burslem Company is what is called a gas consumers company, because the shares are in the hands of a very few. Our company is open to all the town who choose to apply for shares. I know nothing of the starting of the Burslem Company, but I know the shares are in the hands of a few, and I have no doubt the other inhabitants would be very glad to buy shares and participate in the profits. My predecessor had been supplied by the Burslem Company, but Mr. Haswell solicited me to take it from the British Company, and I did so; but I have no preference for one over the other.

Re-examined by Mr. CHITTY: With reference to the corporation opposing two bills in 1858, I took no interest in the matter; neither can I state what part the corporation took, but I have heard since that time that there was a petition from the corporation of Hanley. I do not know how I derived the information. When the commissioners renewed the contract with the British Company they had no option. It was British or darkness. We were subject to any terms they chose to ask Mr. Pearse, the engineer, and several of the directors, came, and the matter was discussed very warmly; but they held their own. They insisted that they could not supply it on more advantageous terms. I know we ascertained by communication with many other towns that they were supplied on much better terms; that was brought under their notice, but they distinctly refused to lower their prices. I should think my books would show resolutions passed many years ago recommending a local company to be established in opposition to the British before I was appointed. I could show the page of the old book if it were here; the dissatisfaction was so great at that time. My office is at Hanley, and if I had had my house supplied by the Burslem Company it would have involved keeping two accounts; therefore I at once acceded to Mr. Haswell's application. The Burslem Company charged a little higher, and that is another reason, no doubt. I am not sure whether they did at that time; I think at that time it was 4s. 6d.; that is three years ago, and I do not think there was any difference then. I should like to state that we have no mains between the village of Cobridge and Etruria; no gas-mains and no public lights for a distance, I should think of half a mile. I have the clause now about the mains which I was questioned about at the former part of my examination; I could not find it at the time:—"And also shall and will at their own cost and charges provide and lay down all necessary and proper mains, ducts, pipes, and other apparatus for supplying gas to all such public lamps in manner hereinbefore mentioned; it being stipulated and agreed that, if in the performance of this covenant it shall in any case be necessary to lay down new or additional mains extending more than 100 feet in length beyond the then limit of the mains, then the said commissioners shall either provide and lay down service-pipes from the existing mains at their own expense, or shall reimburse to the said Jacob George Wrench, John Wilkin, and Edward Stewart, or the said British Gaslight Company, one moiety of the costs and expenses of providing and laying down such extra length of mains of fit and proper sizes, over and above the first 100 feet thereof; such mains to be and remain the property of the said British Gaslight Company."

Mr. *J. S. Forbes*, examined by Mr. LLOYD.

I am a civil engineer, architect, and surveyor, in practice in Hanley and Macclesfield. I have been surveyor for the borough of Hanley since 1859—about twelve months after the commissioners ceased to act. The price charged by the British Company from 1859 to November, 1863, for the public lamps, was £3. 0s. 6d. per lamp, for nine months, five moonlight nights excepted. Besides that, they supplied by meter the markets, town-hall, and public offices, at 4s. 6d. per 1000—the same as to ordinary private consumers. In July, 1861, the Lighting Committee were dissatisfied with the charge for the public lamps, and were desirous, if they could not obtain a reduction in prices, to obtain the lighting for more moonlight nights per month than they were then having lighted. The committee obtained no reduction upon the public lamps, but they obtained a reduction of 10 per cent. upon the amount paid for the gas consumed by meter. Of course, the corporation always paid promptly, and they gained about £20 a year out of £200. At the end of 1862 there was further dissatisfaction. About that time I was brought into connexion with a relation then managing gas-works, and I had a good deal of talk about the supply of gas, which at that time was very bad in Hanley. I had several conversations as to the probability of being able to do something, but nothing was done, as I was in a bad state of health at the time. The feeling of dissatisfaction was pretty general. In November, 1863, there was for the first time a reduction of price announced by the company—from 4s. 6d. to 4s. 3d. That did not affect the price per lamp. On the 24th of November the Lighting Committee had a meeting, at which the matter of reduction came before them, and they declared it was not enough to meet the requirements of the borough, and a resolution was passed that the council should memorialize the British Gas Company for a further reduction. In July, 1864, I was retained as engineer to the Hanley Gas Consumers Company. I saw a growing agitation upon

the matter from February in the same year. As far as I could form an opinion, it was a *bonâ fide* company formed by the gas consumers of Hanley. I was present at a public meeting on the 15th of July. On the 19th of July the Lighting Committee considering that, in consequence of the reduction to private consumers there ought to be a corresponding reduction in the case of the public lamps, agreed to make a demand upon the British Gas Company to supply gas for another month in the year. On the 21st of July we got a letter from the secretary of the British Gas Company announcing a reduction from 4s. 3d. to 4s. per 1000 feet, upon our metered lamps as well as to private consumers. That was about five days after the meeting was held. On the 26th of July the Lighting Committee resolved that the British Gas Company should be asked to make a proportionate reduction in the price per lamp, as they were reducing their charges to private consumers. A reply was received on the 8th of September—six weeks after—offering to add the month of May, which was then unlighted, provided the contract was made for three years instead of one. In view of the fact that there was a company just formed, the committee objected to a three years contract.

Cross-examined by Mr. O'MALLEY: I do not know whether they communicated an answer; but there was a resolution of the committee that the offer to light the month of May was not sufficient (there was some difference of opinion, I think, about that) unless they also added two moonlight nights to the five, in addition to the month.

Re-examined by Mr. LLOYD: On the 17th of September, the Lighting Committee came before the council, and there was considerable discussion. The council passed a resolution, recommending the Lighting Committee to make the best terms they could. On the 21st of September, the gas company withdrew the requirement for a three years contract, and stated that the extremely low price charged for the public lighting in Hanley precluded the directors from granting the additional concession named. So we have not got a single penny off the public lamps.

Mr. O'MALLEY: You got the additional month.

Witness: No we did not.

Mr. LLOYD: How is that; was May added?

Witness: No; the British Gas Company withdraw, by their letter of the 21st of September, the offer made to light in May. There was considerable discussion in the council, and the British Company upon that withdrew the offer, pending proceedings here, I thought.

Mr. LLOYD: Here is the letter of the 5th of September, the letter from the Gas Company, offering to add the month of May if they had a three years contract. "I am desired to state that the directors are willing to add the month of May to the contract, less five nights for the full moon without any additional charge, provided it is as formerly, for the period of three years?"

Witness: That is quite right.

Mr. LLOYD: Then you pass a resolution that there shall not be a three years contract?

Witness: The Lighting Committee thought that the extension time was not sufficient; they wanted two moonlight nights in addition, and that was the result I think.

Mr. LLOYD: Then on the 21st of September there is the letter we are talking about now?

Witness: In that the British Gas Company withdrew the offer they had made us as to the extra month of lighting.

Mr. LLOYD: I will read the letter of the 21st of September: this is from the secretary of the British Gaslight Company, to Mr. Challoner, the town-clerk of Hanley:—

Dear Sir,—In reply to your letter of the 17th inst., I am desired to state that the only motive influencing the board in asking for a contract for three years was to place the Hanley lighting contract on the same footing as it formerly stood, and similar to the lighting contract with the neighbouring townships. In meeting the wishes of the Lighting Committee by giving the month of May without additional charge, the directors in asking for a three years contract, sought no benefit to the company thereby, and therefore unhesitatingly withdraw their request. I am to add that the extremely low price now charged for the public lighting in Hanley precludes the directors from granting the additional concession named.

It is not very clearly worded. I see it is quite susceptible of the construction that Mr. O'Malley puts upon it: that they withdrew the condition as to three years that they did offer, the month of May; refusing at the same time the two additional moonlight nights?

Witness: They withdrew the month of May decidedly, because the offer for ten months was made; at least, I read it so.

Mr. LLOYD: Upon that was any contract whatever drawn up between the parties?

Witness: Not at that time.

Mr. LLOYD: The matter there rests in the hands of the Lighting Committee, does it not?

Witness: Yes.

Mr. LLOYD: Now I must interpose this letter, because I take it in order of time. On the 26th of October was an offer made by the Hanley Gas Consumers' Company to the Town Council to undertake the lighting of the public lamps themselves under the powers that the Town Council could give them?

Witness: The Town Council had the power under the Lighting and Watching Act to light the public lamps, and to erect mains for the purpose, or enter into a contract with other parties to do so.

Mr. LLOYD: This is our company's offer to the Town Council; it is directed of course to Mr. Challoner:—

Sir,—I am desired by the directors of the Hanley Gas Consumers Company, Limited, to inform the Town Council that the company will be prepared to supply the public lamps with gas at the rate of 3s. (three shillings) per 1000 cubic feet, gauged by meter, or at fixed charge of £2. 5s. (two pounds five shillings) per annum per lamp. This would be a reduction of more than 25 per cent. from the existing charges, and would save the ratepayers at least £300 a year. The company will also light the lamps during the whole twelve months instead of for eight months only. I am also requested to point out that the council are empowered under the Watching and Lighting Act to authorize the new company to lay down mains for the use of the public lamps; and if, after due consideration, the council should be prepared to exercise their power, and enter into a contract with the company on the terms already mentioned, the company may at once proceed with their works, continuing their application to Parliament merely for authority to supply gas to private consumers. I have to request that you will be good enough to lay this communication before the council at their meeting to-morrow (Thursday) and inform me of their determination at your early convenience.

Was that letter referred to the Lighting Committee?

Witness: It was. A deputation from the Consumers Company attended the Lighting Committee, and the matter was fairly discussed. The Consumers Company never had any communication from the corporation. Our parliamentary notices appeared on the 12th of November, and on the 16th of November the British Company announced a reduction to 3s. 6d. per 1000 feet, to commence from January 1, 1865—a reduction of 9d. during the proceedings of the Gas Consumers Company. On the 19th of February, this year, Alderman Wedgewood gave notice at the meeting of the council of his intention to move that the corporate seal should be affixed to a petition in favour of the Gas Consumers bill; and on the 22nd, the British Company—after withdrawing their previous offer of 10 months—came back to 10 months again, and also offered an additional number of hours per lamp; and they also raised the illuminating power from 10 to 13 candles, and reduced the price to £2. 15s. per lamp from £3. 0s. 6d. They also offered to waive their right to six hours notice before testing; in fact, we almost recognized the Gas Consumers Company in the shape the British came down to. But even then they were in a very undecided state of mind. They were not satisfied with that reduction; and I thought, at last, it would almost come to lighting the public lamps for nothing. On the 1st of March they offered to light the lamps for 10 months—they had previously offered to increase the illuminating power from 10 to 13 candles—and they gave an additional candle, making 14; and they offered also to paint the lamp-pillars once in two years. That was, of course, previously done by the corporation; and they offered also to take 5 per cent. off the gas consumed by meter. I do not know of anything in the price of coal, or the number of persons taking gas in Hanley, or anything else except the presence of another company in the field, to account for these reductions. Alderman Wedgwood's resolution was discussed on the 21st of March, and carried by a majority of one; therefore the seal was put to the petition. We have 358 lamps in Hanley. There is a difference of about £130 per annum, out of about £1200, between the terms charged to September, 1864, and those now charged. 358 lamps is a very small number for the area of population of Hanley. The town is very inefficiently lighted. The corporation provide the lamps, pillars, &c., and fix the services. The proportion of lamps to population is 1 to 107. I have communicated with 30 or 40 other towns, and I find that the average is 1 in 60. The Lighting Committee, when they think they can provide new lamps, see how many streets one lamp will light; and they are obliged to place the lamps at the corners of streets, so that one lamp will light two streets. I think we ought to have 250 additional lamps. The consideration of cost was the reason for economizing the number of lamps. The Lighting Committee have ordered 46 additional lamps since the reduction. I have tried to make out how many cubic feet of gas is burned per head in Hanley in proportion to population. I find that the gas-rental for the Pottery station is £11,341. Hanley has a population of 37,570, and Tunstall, the other station or town lighted by the British Company, 13,000. I have taken these up to 1864, which gives an amount of £8400 for the British Company for Hanley, according to the population, and £2900 for Tunstall; that is the way I tried to arrive at it. The price they then charged was 4s. 4½d., and it amounts to a total of 36½ million cubic feet per annum in Hanley—that is, at the rate of 973 cubic feet per head of population. The British Company do not give any returns which would enable me to come nearer than that. According to Mr. Hawksley, 2000 feet per head is the usual consumption. I have tried to make out a statement showing the number of houses which might probably be supplied with gas, I have not been able to complete it, but I know of 4000. The factories are not so fully lighted as they might be. We had no photometer at Hanley belonging to the corporation till after the formation of this company; but as far as I could judge, the quality was bad, and there was no regular supply to the lamps. The flames were of all sizes, arising to a certain extent from fault in the burners. The British Company have the entire management of the public lamps, and I hope to see an alteration. In November, 1864, we obtained a photometer, and from that time to February we almost daily had testings of the illuminating power of the gas. The British Company were not aware of it for a short time. The first results were 8·40. I did not take all the testings, nor was I always present. Some were taken by Mr. Russell, who fitted up the photometer, and some by my assistant. The average for the first three days was 8·40. In the latter part of November and beginning of December, the average got up to 11. It went at last as high as 17 candles. All our testings were made with the same photometer and the same burner—the Birmingham burner. I have prepared the estimates for the construction of the works. The total cost will be £32,875, to enable us to produce 66 million cubic feet of gas. It is only proposed to supply works, in the first instance, sufficient to manufacture 33 million cubic feet, at an expenditure of £25,000. I made that estimate knowing that 2000 feet is the average consumption per head of gas; that leaves us an available market for the sale of 36 million feet, without interfering with the present supply. We should raise £20,000 by shares, and borrow £5000, to be secured on the works. We calculate we should borrow it at 5 per cent. When we wanted additional capital, we could call up the other £10,000 upon the shares. The site for the works is a suitable one for the purpose, surrounded by a nest of nuisances. It is on the banks of the canal, and has a siding from the North Staffordshire Railway running along the entire length of the south side of our works; and from that siding we shall make arrangements to be supplied with coal, if necessary, or by the canal. It is the lowest point in Hanley. I do not think there will be any difficulty in laying the mains from the disturbance of the streets. The British Company say there is an excessive leakage caused by mining operations; but during late years I do not know of anything seriously affecting the mains of any company. I have only known of two cases of serious leakage in Hanley in six years.

Cross-examined by Mr. O'MALLEY: I am the resident engineer of the company. I have had no experience in gas-works till the present time. The estimates have been made out in conjunction with Mr. Stevenson and Mr. Hedley, the consulting engineer of the company.

Mr. O'MALLEY: They are the persons in conjunction with whom you made out this estimate?

Witness: Yes.

Mr. O'MALLEY: In point of fact, they being gas engineers, they are the persons who made the estimates?

Witness: I should not be satisfied with them unless I approved of them.

Mr. O'MALLEY: You would be acting under their authority?

Witness: No; I think rather that they are acting under mine.

Mr. O'MALLEY: Then I understand you that Mr. Hedley and Mr. Stevenson were acting under your authority?

Witness: There has been some difference of opinion; I have not been able to see my way clearly at times in the matter of estimates, and therefore I have not been satisfied until I have been able to see for myself the practicability of the estimates or the amounts put down for making these works. I would not take their estimates unless I felt perfectly satisfied that they were correct.

Mr. O'MALLEY: Then do I understand you to say that you, never having had any experience in works of this description, checked and controlled their estimates for the works?

Witness: Estimates for making the works, as a matter of engineering, is a very simple matter.

Mr. O'MALLEY: Do I understand you to say that you checked and controlled their estimates?

Witness: Yes, to a certain extent; that is, where I could not understand them.

A MEMBER of the COMMITTEE: I think it is rather pressing the point Everybody must understand what he means; he is an engineer, and he has called in the assistance of persons who have much more skill in that particular thing, namely, with regard to the gas-works; but he is not under their control, he takes their information and tests it.

Witness: We consult them and we pay them.

Cross-examination continued: Mr. Hedley was engaged about the same time as I was. We both attended the first meeting, and both were retained. I had never used a photometer before these examinations were set on foot. The burner we used was the one described in the Act as the Birmingham burner. I have employed no other. Mr. Russell is the manager of the gas-works at Banbury, I think, but am not certain. He was here I should think for a month; most likely Mr. Hedley introduced him. My assistant is a young man about 18 or 19 years of age. I never called in any one belonging to the British Company, because I did not see the necessity for it, as the gas was improving. The photometer was erected at the gas consumers office. I am not certain as to the price of gas at Burslem. The Hanley price governs the price of the other towns, and as the gas was lowered at Hanley so it was lowered in other towns. I think the price at Burslem is 4s. 1d., and at Longton 3s. 7½d., with a discount, which varies from 10 per cent. to 7½. I think the price at Newcastle is 4s. per 1000, but I am not clear about it. With the exception of the British, all the other companies in the pottery districts are local companies. When Alderman Wedgewood moved the resolution in the corporation for sealing the petition the numbers were 12 to 11. Of the majority two aldermen and nine councillors were shareholders in the new company; a great many of the number on the other side were members of the Lighting Committee. The corporation consists of 30 members; five were present on the occasion who did not vote. I am not aware that of the other five three have signed a petition against our company.

Re-examined by Mr. LLOYD: As far as I know the Birmingham burner is the only one defined in an Act of Parliament. On the question of buildings, I know more about that than gas engineers; and I have taken the best advice as far as the other questions are concerned.

The CHAIRMAN said the learned counsel need not give further evidence on that point.

Mr. *Henry Woodall*, examined by Mr. CHITTY.

I am the manager of gas-works at Longton, in the Potteries. Our company, which was established in 1859, has no Act of Parliament. We found the Stoke Company already in possession of the ground. They indicted us for a nuisance, and we were restrained from putting on services to private consumers for the future. We supply the town of Longton itself, and the extent of our mains is 10 miles. The district contains about 18,000 inhabitants. The share capital of our company is £10,000, all paid up, and borrowing powers for £3000. We have 600 customers, and supply 177 public lamps. Our average price during the past year was 3s. 7d., allowing for discount, including the public lamps, which we supply by contract. Longton coal is about 10s. a ton, which is higher than at Hanley. Coke would fetch a little more at Longton than at Hanley, but the other products a little less. On the whole, they would be able to produce gas as cheaply in Hanley as at Longton. Our profits for the year ending December were 12 per cent., after paying 5 per cent. on the bond capital. We were able to divide the whole if we chose. Our dividend for the previous three years had been 7 per cent. During competition our price went down to 3s., but shortly afterwards it went up to 4s., after which we paid a dividend of 5 per cent. Since then we have paid 7 per cent., and 4s. was maintained to the 31st of March last, when we reduced the price to 3s. 8d. We make about one-third of what they make at Hanley. With an increase of capital of £2000 we could increase our make to 20 millions. We could then supply gas with a profit at 3s. 6d. With a capital of £25,000, I could produce 30 million cubic feet of gas at a profit—so as to divide 7½ per cent.

Cross-examined by Mr. BURKE: The Stoke Company is under an Act of Parliament, but the Longton Company is not, and, therefore, under no parliamentary restriction, either as regards illuminating power, price, or dividend. We allow 5 per cent. for prompt payment—that is, payment within a month from the date of the invoice. With that discount our lowest charge is 3s. 5½d. or 3s. 5¾d. We charge the same price to large and small private consumers. The charge for the public lamps is £2. 15s. each, which is at the rate of 3s. 4d. per 1000 feet, which price will remain for two years. We have no arrangement with the other company, and both have pipes laid down in the streets. If there is an escape, we open the ground, first in one line, and then in the other; but there is a good feeling between the two companies, and we advise each other, so that one break generally suffices. There is nothing to prevent that good feeling ending in amalgamation. With one company and one capital, I think the public could be supplied cheaper than with two. I know that by parliamentary legislation a company must reduce their price when they can divide 10 per cent., and have a sufficient reserve-fund, and the smaller the capital the sooner that will take place.

Re-examined by Mr. CHITTY: If a company is disposed to act honestly, it is desirable there should be only one company; but it is necessary they should be placed under strict regulations, particularly with regard to the limit of price.

Mr. *T. A. Hedley*, examined by Mr. LLOYD.

I am a civil engineer. In July last I was asked by Mr. Blakiston if I would become consulting engineer of this company, and I said I should be very glad to accept the office. I had never heard of Hanley before. I visited the town afterwards, and met Mr. Blakiston and Mr. Stevenson. At a meeting in the town-hall I was elected consulting engineer, and Mr. Forbes the resident engineer of the company. The clauses in the bill relating to the supply of gas have been put in with my advice, especially the one with regard to the price of 3s. 4d. I consider the charge made for gas by the British Gas Company has been unreasonably high, taking into account the cost of coal and the size of the place. They have now reduced the price to 3s. 6d., and raised the illuminating power from 10 to 14 candles. If the new company could obtain a consumption of 30 million cubic feet per annum they could sell gas at 3s., and pay a dividend of from 8 to 10 per cent. I believe, however, they will get a consumption of 60 million feet, and be able to charge 2s. 9d., while paying a 10 per cent. dividend, and laying by a reserve-fund. I have never seen a town so badly lighted as Hanley is at present. The reduction of price would lead to a greatly extended consumption. I think that gas-fittings should be supplied by the company at a rental. I consider that there is room for the establishment of the new company without interfering with the old one. I have gone through the estimates, and think they are sufficient.

Cross-examined by Mr. O'MALLEY: I have never been connected with the getting up of consumers gas companies except as a witness. I was concerned in the Birmingham case last year on behalf of the consumers, but I was not examined as a witness. I was asked to go down to Birmingham to make calculations, which I did. The bill was rejected, because it was very badly got up. The Exeter Gas Consumers Bill was not rejected this session in the House of Commons. It was not passed, because the chairman of the committee said, "In the interest of the consumers we cannot allow two companies to be doing the work of one." We all agreed to it, because a well-regulated monopoly is the best thing you can have. I think it would be better for the people of Hanley and for the British Gas Company that we should be required to purchase their works. I do not say that that would be the consequence if this bill passes.

The CHAIRMAN: Answer the question. Is it one of the plans which has passed through your mind to buy up the old company?

Witness: I suggested it on one or two occasions.

The CHAIRMAN: Then it is one of your plans?

Witness: I was in hopes that the committee would suggest it.

By Mr. O'MALLEY: There is no possibility of a fierce competition if a second company is established, even if the old company supplied gas at a lower price than the new, because the great bulk of the consumers, although they paid a shilling more per 1000 to the latter, would themselves get the profit on the additional consumption, which would equalize the thing. The provision in the Act of Parliament to secure a reduction of price when the company have exceeded a certain amount of dividend, is never carried out. I have said before that I never got up a gas consumers company. I have proposed a company for the establishment of gas consumers companies throughout the land, but it has not been brought before the public yet. I heard Mr. Rodwell's statement that there had been a proposition by the British Company to buy off this scheme.

Mr. LLOYD said that statement was a mistake on the part of Mr. Rodwell, which he immediately afterwards corrected.

Cross-examination continued: At Uxbridge, I manufacture the gas and supply it to the company, charging them 2s. 6d. per 1000 feet upon the registration at the consumers meters. The company charge 5s. 6d. per 1000, which is a great deal too much. I cannot tell what dividend they are paying. I was a witness for the Kent Gas Consumers Company, whose bill was before Parliament this session. That bill was rejected on a question of site, before the engineering evidence was heard.

Re-examined by Mr. LLOYD: I am not in any way responsible for the charge made by the Uxbridge Gas Company, and if the consumers had retained me, I should have given evidence to show that the price was too high. There is no foundation for the charge that I go about getting up agitations against gas companies, for the sake of getting employment for myself. I consider the fact that 550 persons have become shareholders in this company is pretty good evidence of the favour with which it is regarded at Hanley. The British Company having been tried for many years, and not having pleased the consumers, it would be better that this Act should pass, and that we should be allowed to purchase their works at a fair valuation. They have prevented people burning gas, in consequence of the bad quality and high price at which they have supplied it.

Mr. *Forbes* recalled, and examined by Mr. CHITTY.

We do not propose to go through the town of Burslem with our mains, in order to supply Smallthorn. We should pass along the turnpike road. We do not care about supplying the place, but as it is in the district of the British Gas Company, and we come for powers to supply their district, we were obliged to put it in. We shall be very glad to have it expunged.

Cross-examined by Mr. LOCH: We take powers to carry our mains through the borough of Burslem, but not to light there. The turnpike road belongs to the trustees, and the local board have no interest in it whatever. Our clause is a general clause, having reference to Burslem at large, to lay mains and light.

The CHAIRMAN inquired whether the promoters would be willing to be limited not to light in the Burslem Company's district.

Mr. LLOYD replied that they would, and said he had been informed a clause had been offered to them for the purpose.

Cross-examination continued: We take powers to interfere with any sewers, drains, water-pipes, and gas-pipes within the limits of the local board, but practically we should not do so. I think it is quite possible to lay our mains without interfering with the mains of the Burslem Company. I have never laid any gas-mains myself, but I have seen it done, and it seems a very simple operation. I have never been an engineer to either a gas or water company.

Mr. *G. W. Stevenson*, examined by Mr. CHITTY.

I have been in practice as an engineer for upwards of 18 years, and have had considerable experience in the construction of gas-works. I have made an estimate of the cost of the works required by this company, and my figures coincide very closely with those of Mr. Forbes and Mr. Hedley. I know the proposed site, which I think is an admirable one for the supply of this district. I have heard the amount of gas at present consumed at Hanley, and consider that it is very much below the average. I do not know an instance where the supply is so small, taking into account the extent of the population. It ought to be something like 80 million feet per annum, and it is something under 40 millions. I know the district very well, and I have no doubt if gas were supplied at a cheap rate there would be a large increase in the consumption. At Halifax, when the corporation bought the gas-works from the company some nine years ago, there were only 2000 consumers. Now there are upwards of 9000, and the bulk of them are the inhabitants of cottages—people who have simply one or two lights at the utmost. I suppose there are more than 4000 of the total number of consumers in Halifax who pay less than 6d. per week for their gas. I think that the price at Hanley is higher now than it ought to be. I do not know whether the British Company could supply at less than 3s. 6d., and pay a 10 per cent. dividend upon their capital; but upon a proper expenditure of capital at Hanley, gas could be supplied at 3s., and pay from 7½ to 8 per cent. Either the company have been—I will not say victimizing the public, but charging more than they ought to have done in times past, or, they are now charging less that they ought to do, in order to defeat this opposition. In either case they are wrong. There is no commercial reason why they should so suddenly have reduced the price from 4s. 6d. to 3s. 6d. within so short a period. There is no guarantee that it will be kept at that price. I have known a company reduce their price, when under opposition, and afterwards raise it. I refer to the Exeter Company. I think they reduced their price to 5s., under opposition, but immediately it was withdrawn, they raised it to 8s. 6d.

Mr. BURKE: How do you know the fact?

Witness: I heard it stated so in evidence when the bill of the company was in Parliament this year.

By Mr. CHITTY: In Plymouth, the charge for gas is 2s. 9d.; in Liverpool, it is 3s. 2d.; in Manchester, 3s. 2d.; in Bath, which is a very similar place to Hanley, it is 3s. 9d.; at Whitehaven, 2s. 6s., and 2s. There are two com-

panies there competing with each other. In Leeds there are two companies in very active competition, supplying 18-candle gas at 3s. 4d per 1000 maximum, and the companies are both paying their full parliamentary dividend. The illuminating power of gas is a very important element of consideration in estimating the price. I think there is a fair commercial opening for a new company at Hanley. The present company have neglected their opportunity of properly supplying the public, and doing business. I can only account for it on the supposition that their policy has not been a wide and liberal one.

Cross-examined by Mr. BURKE: I am not one of the employés of the new company. I have only been engaged by them as a witness. I visited the town on two occasions; the solicitor of the company retained me. I am not aware that the reduction of the price of gas in Liverpool, to 3s. 2d., is the result of parliamentary legislation refusing to admit competition there. I know that for many years there has been no competition there. I do not know what the price was during competition, some years ago it was much higher. The state of trade is a very accurate barometer of the sale of gas, but there has not been such an alteration in the state of trade lately at Hanley as would justify the reduction of 1s. per 1000 in the price of gas. One of the Whitehaven companies pays a dividend: the other does not. I did not give that place as an instance of successful competition. I was asked the price of gas at other places where the price of coal and the value of residual products were somewhat similar to those in Hanley. The other company at Whitehaven pay, I believe, 4 per cent. I do not think that that is an adequate dividend for a trading company. I consider the price of gas is too low at Whitehaven. I do not know the price of coals there. It is a poor coal, both as regards the quality of gas made from it and the quantity. I was a witness in the Exeter case, and was brought up from Halifax to give evidence for the consumers company, as to cheap prices. They were seeking to establish competition with the existing company, and giving evidence of their delinquencies. The referees reported adversely to the old company. By the advice of the honourable chairman of the committee, Mr. Jackson, the bill was withdrawn upon certain terms. In that case the old company were in Parliament and the consumers company too. They were competing bills, and it was suggested by the chairman of the committee, Mr. Jackson, that the bill of the new company should be withdrawn upon the insertion of certain clauses in the old company's bill to suit the views of the consumers of Exeter, and upon payment of the costs incurred by the new company. One of those clauses was that the maximum price of gas should be 4s.; another, that the gas should be of 14 sperm candles illuminating power, and that the consumers should have liberty to test the quality of it without notice. I did not hear the chairman state that on no account would the committee tolerate two companies; but I did hear him say that if the two companies did not agree to the terms proposed, that the committee would open the whole question again, and go through it *de novo*. I did not say that the existing company at Hanley could not afford to sell gas for 3s. 6d. and pay a dividend, but that I did not know whether they could or not, for I did not know the amount of their capital. The new company could do it, and the result would be to drive the old company out of the field.

Mr. BURKE: And you think it fair that one company which has been established since 1819, with a large capital, and has been supplying Hanley for all those years, should be ruined for the purpose of establishing a new company?

Witness: This company have other resources; they supply other towns. It is not a mere local company, established for the consumers of Hanley. And it is clear they have not fulfilled their obligations, or they would not be in the position they are this day. They must have laid out a large capital. They used to supply the whole of the Potteries, but they have been driven out of all the towns one after the other. If this bill should become law, I have not the least doubt that the British Gas Company, as far as their existence in Hanley is concerned, would be defunct. I think the best thing that could be done would be for the committee to order the new company to purchase their works, so that there should not be an excessive amount of capital. I do not mean that they should purchase them on their own terms, but at their commercial value, whatever that may be. I know that they are entitled to 10 per cent. dividends, but I would not take the works upon an estimate of 10 per cent. I would have them valued according to their present profits.

The CHAIRMAN: I do not think that we need go into that.

Witness: That is not the way of arriving at the value of a gas-work.

By Mr. BURKE: In Halifax all the profits of the gas-works are applied in the reduction of the rates, and the public get the benefit of them. The maximum charge is 4s., and the minimum charge 3s. 2½d.; the average is 3s. 7½d., including the public lamps, which are supplied at cost price—viz., 20d. per 1000 cubic feet. There are discounts to large consumers, which I think are too large. I do not agree with the price which the corporation of Halifax are taking, and I have advised them to reduce their price to 3s., by which they would be gainers. The profit they made last year was £9700, upon a capital of £119,000. That is under 10 per cent. The cost of common coal there is 10s., and cannel coal about 21s., per ton. They use 10 per cent. of cannel, and supply gas of 21-candle illuminating power. They do not get good prices for residual products; it is too much of a coal district. They get from 6s. 8d. to 5s. per ton for coke. The small consumers are charged 4s. per 1000 for gas.

Re-examined by Mr. CHITTY: The residual products at Hanley would realize about 1s. 6d. per ton of coal carbonized. There can be no circumstances there which would warrant the recent reduction of price 30 per cent.

Mr. LLOYD said he proposed to put Mr. Blakiston, one of the solicitors to the bill, in the box, not for the sake of asking him any questions, but to enable the petitioners counsel to cross-examine him.

The CHAIRMAN said he did not think it necessary.

Mr. LLOYD said he would at a future period of the inquiry put in a certified copy of the Memorandum and Articles of Association of the new company, as being referred to in the preamble they should be given in evidence; but the witness who would produce them was not now in attendance.

This completed the case for the promoters.

Mr. BURKE said, before addressing the committee on behalf of the petitioners, he would proceed, according to the custom sometimes adopted, to call his witnesses.

Mr. *Charles Copland*, examined by Mr. BURKE.

I am a civil engineer, and the general superintendent of the works of the British Gaslight Company. I have filled that office for 11 years. They have works at Norwich, Hull, Trowbridge, in Wiltshire; Holywell, in North Wales; and in the Staffordshire Potteries. In Hull there are three gas companies, but each one is confined to a separate district. At Norwich the British Company have the sole supply. We have a separate Act of Parliament for each place, and in all of those Acts the Gas-Works Clauses Act is incorporated. We have been in the Potteries district since 1826 or 1827—many years before I was connected with the company. I believe we have never been without opposition in that part of our district; we have been in competition with others from the first. We have had to compete with the Stoke Company in one part, and with the Burslem in another. In Hanley at present we have the sole supply, but that has not always been the case. When we went before Parliament with a bill for the Staffordshire Potteries the Stoke Company were also promoting a bill, and it became a question with the committee whether an arrangement should not be come to whereby each company should take their own district. After some considerable discussion it was agreed, I believe, that the Stoke Company should retire to their district, and that we should confine ourselves entirely to the supply of Hanley. That was in 1858. We are under the Gas-Works Clauses Act there, which Act contains all the restrictions which Parliament has thought it necessary to impose on gas companies. There are also special clauses in our Act by which we are subject to a penalty if we supply gas of a less illuminating power than 10 candles. The company keep a photometer at the works, and if any application had been made to the board by the local authorities I believe they would have conceded the means of testing the quality of the gas, but no application has ever been made to them to do so. The Staffordshire station consists of two works, one devoted entirely to the supply of Tunstall, of which we have the sole supply. We pass through a portion of Burslem, but have no power of lighting there. The other works, which are the larger of the two, are situated in the centre of Hanley, immediately opposite to the site proposed to be taken by the new company, which is at the lowest level of the town. From those works, and with the apparatus we have, we could supply nearly double the amount of gas required to be consumed in that district, so that the erection of new works would be a wasteful expenditure of capital. The capital of the station is £33,000, which I believe includes everything; that is the amount standing in the ledger. The works are only just beginning to pay the profit which we are entitled to receive under our Act of Parliament. We are restricted to 10 per cent. upon the old capital and 7½ upon the new. I believe it is only for the last two years that we have approached 10 per cent., but I do not like to speak positively upon the question of dividend, for I have not got the figures before me. The public have the power of enforcing upon us a reduction of price when our profits are more than sufficient to pay 10 per cent. Our accounts are annually lodged with the clerk of the peace, under the provisions of the Act of Parliament. The public have the power of examining those accounts, and if our profits exceed 10 per cent. can apply to the quarter sessions to obtain a reduction, which is the law applicable to the majority of companies in the kingdom, including the metropolitan companies. The cost of our works is a sufficient evidence that our affairs have been conducted with a view to economy. It is a common calculation to take £1 a head of population as the value of such works, so that looking to the population of Hanley, the works would cost £38,000, but we are under that. That there is not a better position in the district as a site than that occupied by our works is proved by the circumstances that our opponents have taken a corresponding site on the opposite bank of the canal. The canal passes in front of the retort-house, and we have a wharf there for the shipment of products, &c. In many cases we have been in advance of the wants of the public with regard to the extension of our mains—that is, if we have seen a prospect of a remunerative trade, we have always been prepared to lay down fresh mains. We have invariably acted in accordance with the wishes of the local authorities in this respect. We have been continually enlarging the works since I have been connected with the company. The make of gas last year was 64,968,000 cubic feet at the two stations. The make at the Etruria station was 47,800,000. With the apparatus we now have we could make 450,000 cubic feet of gas per day. The greatest delivery last year in any one day was 283,000 cubic feet. Our works are capable of considerable extension, and we have sufficient land for the purpose, because we could get rid of our products readily by carting or shipment. We are, therefore, in a position to meet any increased demand that the public may make upon us. Our mains, including the length we have driven to Smallthorn and Norton, extend over 23 miles and 62 yards. The soil of the district is very unfavourable for laying down mains, because it is very porous. The roads are composed of broken saggers, which make a very unstable foundation; they are pitched together without any regularity, and the mining operations cause frequent fractures in the mains. The subsidence of the ground often draws the sockets of the mains, and the gas then travels along the open bottom. It is very difficult at times to detect the leak; you may travel over half a mile before you do so. The leakage involves a considerable loss of gas, and of considerable risk as well. Our leakage has been gradually reduced since we were districted. When we were in competition with other companies the leakage was very heavy. Since then we have been arranging and repairing our mains and services, and our leakage is now going down to such a figure as I believe would be the average of gas where the supply is properly dealt with. In the half year ending December, 1863, our leakage averaged only 12 per cent. In June, 1858, which was the half year before we were districted, we lost 33 per cent. of the gas we made. The reduction has been effected through our having a better control over our mains, which are not disturbed by any one but ourselves. Formerly it was a common matter that our mains were in juxtaposition with the mains of our opponents, and we could not touch the service of one company without laying bare the pipes of another. The number of our consumers in the parish of Hanley and Norton-in-the-Moors is 2224. Many of these are small consumers. We have 886 whose consumption of gas is under £1 a year, and 1043 under £5. We have only 321 customers whose annual gas-rental is over £5. The total gas-rental last half year was £4461, which represents a consumption of £203 per mile of main, or £406 per annum. I am not prepared to say whether that is or is not a large rental per mile; I have not gone into the question. No doubt the larger the consumption the cheaper the gas can be supplied, both on account of the cost of works and the manipulation. If another company were to be allowed to supply gas in our district, and take away some of the consumers from our mains, we could not go on supplying so cheaply as when we have the maximum consumption. We supply the public lamps. There are 368. They are lighted under a yearly contract with the corporation. That contract defines the time when the lamps are to be lighted and extinguished. The price charged for them is £3. 0s. 6d. each per annum, which includes the cost of lighting, extinguishing, and keeping the lamps in order. By comparison with other towns, I think this is a low charge. My calculation I make of the consumption of each lamp is 15,500 cubic feet per annum; but it is over that, so that the charge is about 3s. 2d. per 1000. The net price at Stoke is 3s. 7d.; at Burslem, 3s. 2½d.; at Longton, 3s. 6d.; and at Stafford, 3s. 3d. These are all places in the same neighbourhood as our works, and in each case we are below them in price. The companies in those towns are all local companies, composed of residents, I believe, entirely, and having the monopoly of supply. If they

had not monopolies, probably they would charge more, to get a dividend. Our charge to private consumers at Hanley has been 4s.; it is now reduced to 3s. 6d. I believe there were discounts when the price was at 4s.; but I am not prepared to speak of that. The trade in the Potteries has been rather declining than otherwise, from what I have heard—that is to say, the American trade has been entirely stopped. I have made a comparison of the price charged by us for gas to private consumers with that charged in adjacent towns. At Stoke, with a population of 35,000, and 2000 consumers, and a make of gas of 40 million cubic feet per annum, the price is 4s. 3d. per 1000; the illuminating power of the gas is 13 candles, and the cost of coal 8s. 4d. per ton. At Burslem, the population is 26,000, there are 1800 consumers, the make of gas is 36 million cubic feet per annum, the price is 4s. 6d. per 1000, the illuminating power is 14 candles, and the cost of coal 9s. per ton. At Longton, with a population of 16,000 and 600 consumers, the gas made is 15 million cubic feet per annum, the price per 1000 4s., the illuminating power 13 candles. At Stafford the population is 15,000, the number of consumers 1035, the make of gas 30 million cubic feet, the price from 4s. 9d. to 3s. 3d per 1000, and the illuminating power 15 candles. Our price, therefore, contrasts very favourably with all these places. Our company have already made an offer to the local authorities to the effect that they will bind themselves to keep to the price now charged, and to attach any other covenants and conditions that may be agreed to between us. We use the Apedale best 7-feet bed coal; the price delivered is 8s. 10d. We use 5 per cent. of cannel coal. Our average make of gas per ton of coal is 9152 cubic feet. The price for products is somewhat low. For coke we get 7s. 9d. per ton. Since the passing of the Act of 1858, we have had a photometer on the works, and the gas is tested nightly at the hour of greatest consumption. Our officers are instructed to keep a daily record of the illuminating power in a book provided for the purpose. That book is here.

Mr. LLOYD said he did not wish to take a technical objection, but as Mr. Copland did not reside at Hanley, he must ask that some one employed on the works might be produced if any use was to be made of the entries in that book.

Mr. BURKE said he would call the officer in whose custody the book was always kept.

Examination continued: This book is presented to me on the occasion of my visits to Hanley, and, in addition, I have a return made to me at Hull monthly. I believe we have taken every precaution to comply with the requirements of the Act of Parliament, both as to purity and illuminating power. Whenever I have tested the gas myself, it has always been free from sulphuretted hydrogen, and I believe it has been for almost two years nearly free from ammonia. It is very difficult to get gas entirely free from ammonia, and if you do, you give rise to another difficulty—that is, the deposition of naphthaline, which grows over the orifice of the pipes, and gradually closes them up. Every gas company has this difficulty to contend with—some more and some less than others. Our gas has been considerably over the parliamentary standard, both as regards purity and illuminating power. I do not think any gas company could be put under greater restrictions than we are. There is no reason why our company should not fulfil all the obligations which a consumers company would fulfil, and if we don't do it we ought to be made to do it. Our average illuminating power in 1864 was 13·34 candles. We have offered to bind ourselves by contract to supply 14-candle gas, which is the standard inserted in many Acts of Parliament. To do that we must increase the quantity of the cannel coal used. The cost of cannel coal has risen from 9s. 6d. to 12s. per ton during the last 12 months in consequence of the increased demand, the supply being limited. I know very little of the proceedings of the new company. We kept a stock of fittings until the year 1860, but we found they were such a source of considerable loss to the company, and such an annoyance to the public, that we discontinued the trade. We found also that there were respectable tradesmen in the town who could carry on the work, and people preferred to go to them rather than come to the company. It is a business which in most towns is carried on by individuals and not by the gas companies. Taking it as a whole the trade was a loss to us, and it also created delay in the settlement of our gas-rental accounts. I am sorry to say that the manufacturers in the town have not taken gas to the extent that I have seen it done in other places. I have had many conversations with them on the subject, and the result has always been the same. They have said to me: "We get all we want; why should we spend £50 to £100 in gas-fittings when we can get no benefit from it?" I have always said: "I think you would get a benefit from it in the larger quantity of work done and in its better quality." In many instances we have tendered for a supply, but our offers have not been accepted. It has never been represented to me that the reason was the high price of gas. The manufacturers get their work done by men who work piece-work, and use candles. The workmen like the candle system, because when they have done work they carry the remainder of the candle home with them, which they consider an advantage. I consider it a very questionable advantage. With respect to Wedgewood's manufactory, we have had a main in front for the last 10 years, and we have sent in tenders at various times but have never succeeded in getting a contract for the lighting on account of the expense of the fittings. The complaints which we have received have been of the ordinary character—generally a defective supply, or a meter out of order. They are entered in a book, and have always been attended to immediately. In most cases of complaint as to a deficiency of gas, it arises from defects in the consumers fittings. I should say that the number of complaints in our case have not exceeded the average of most gas companies. There have been no complaints to my knowledge either from the local authorities or private consumers, that we were not fulfilling our obligations. There have been no complaints entered in our book as to the price charged.

Cross-examined by Mr. LLOYD: I reside at Hull, and visit the several stations of the company as occasion requires. I was three times at Hanley last year. I sometimes stay three days at a time; once last year I was there only a day, but a day is quite sufficient to enable me to take a review of the works. I do not give public notice that complaints are to be addressed to me during my visits. The complaints go direct to the board in London. Of course, I should hear of anything of the kind; it would be mentioned to me by the superintendent of the station if anything particular arose. We have had other stations than those we now have, but we have parted with the works to other companies. We had works in London once, and parted with them to the Commercial Gas Company. Our opponents in the parliamentary contest in 1858 were the Stoke Fenton and Longton Company and the Burslem Company. They were supplying gas in parts of our district, but not in Hanley. The result was, in accordance with the recommendation of the committee, they secured their own districts, and we kept Hanley, where we had no opponents. We had no opposition there until the present company started. Our make of gas at the Etruria works is 9152 feet per ton of coals, and we get paid for 7780 feet; that shows a loss of 15 per cent. The new company could not supply with a less amount of leakage than we do. It has never struck me that our consumption at Hanley is small. Our works are equal to twice the amount of consumption, and we are continually adding to them with a view to an increased demand, which is gradually being made. The cost of fittings, I presume, is the reason the manufacturers do not take the gas. We have been anxious to introduce it among them. The public lamps are estimated to consume 5 cubic feet per hour. We have made investigations respecting this matter, and have taken six different places in the town for the purpose. The result was that we found the average consumption be 5·28 feet per hour, the highest being 5·95, and the lowest 4·46 feet. We get a small profit on the charge of 3s. 2d. to the public lamps. The practice of supplying them at a less price than is charged to the private consumer is not peculiar to Hanley. The provision in Acts of Parliament generally is that it shall be at the lowest price charged to any private consumer, but here we are considerably lower than that. The board made the reduction in November last, but, of course, if the manufactory would not have afforded it the directors could not have met the public. We had made reductions at times before that. I think it is pretty well understood why it was reduced then 30 per cent.; I was not consulted on the matter. In testing the gas we have tried several burners. Before the Birmingham burner was used we employed one made by Wright. That is not a superior burner for the purpose, it is inferior; it made a difference of 2 candles. I hold that we have a right to use the best burner for the purpose, because we cannot put carbon into the gas, but we are entitled to get the best results out of the gas, and we ought to use that burner which will do so. I used the Birmingham burner until I found it was so defective that we could not get the proper illuminating power. A particular burner is required for every different kind of gas. If you tried to lay down a law in testing gas, and said that one particular kind of Argand burner should be always used for the purpose, and applied to every description of gas, you would find it impossible to work. I have used Sugg's steatite burner, and found it the best for our gas, because it will burn 5 cubic feet per hour without smoke. If we burn 4 cubic feet the Birmingham burner would come up to the same standard. With 12-candle gas Sugg's burner gives the best results, but not with 14-candle gas. When our price was 4s. 6d. the other companies in the neighbourhood charged about the same. We did not as a general rule allow discounts, except in special cases. They did not reduce their price so quickly as we did, but our reductions have generally been followed.

Re-examined by Mr. BURKE: I am aware that the Secretary of State has furnished a particular form of accounts, which he requires from the Metropolitan gas companies. Our company, I believe, are quite prepared to adopt that form. They are willing to adopt, within reason, anything that Parliament requires of other companies; we are traders with a large business, and anxious to increase it. With reference to the burners employed for testing gas, we think, as I said before, that we have the right to adopt that one which gives the best results, because we cannot put carbon into the gas, but we have a right to make what carbon there is in it applicable to the illuminating power. If a burner will not do that, it is not a proper burner to test with. As the increase of consumption has gone on our directors have from time to time reduced the price of gas. They have done more than they were bound to do by their Act; they have kept a very small reserve only, when they were entitled to a large one, because they were anxious to meet the wants of the public. I think it is the general practice to charge the public lamps at a lower price than is charged to private consumers. The local authorities at Hanley are pretty large consumers, and are paying pretty well now. At each of our stations we have resident superintendents, except in the case of Hull, where I reside, and where I am responsible directly for the manufacture.

Mr. *Richard Spyer*, of the Joint-Stock Company's Registration Office, was called by Mr. LLOYD, and produced the Memorandum and Articles of Association of the Hanley Gas Consumers Company, Limited.

WEDNESDAY, MAY 10.

Mr. *Wm. Brownfield*, examined by Mr. MACKESON.

I am an earthenware manufacturer in Cobridge, near Hanley. I am an alderman, and one of the minority of 11 at the corporation meeting; I am also a magistrate of the borough, and was the second mayor of Hanley in 1858. I was a commissioner under the Lighting and Watching Act, and filled the office of chief bailiff. Cobridge is in the Burslem district. My residence and flint-mills are in Hanley. My factory is lighted by the Burslem Company, but it was lighted by the British Company till 1858, when there was a division of the district. My flint-mills and my house are still lighted by the British Gaslight Company. I was born in Hanley, and still live there. I remember the introduction of the British Company, although I was a boy then. From my position as one of the commissioners and as an alderman, I have had opportunities of observing how the company lighted the borough. I heard no complaints from the inhabitants until last year. I believe the British Company have done their duty to this district in every respect. I recollect a memorial from the corporation in January, 1864, asking for a reduction. I heard no complaints in reference to the price or illuminating power before that time. The agitation for the new company commenced after that time. In my opinion, there is no need for a new company—quite the contrary. If this second company were established, it would have the effect of breaking up the roads, and that is a serious inconvenience, to begin with. There are now water-pipes in almost every street of importance, and, in consequence of the mining operations going on, there are so frequently breakages of the pipes, that they are constantly taking them up, and breaking up the roads and streets. If you have a third row of pipes, it will make it more inconvenient still. Then, in addition to that, there is another reason: you will have to double the capital, of course; and no reduction in the price of gas will take place till both capitals realise 10 per cent. The British Company, if I am correctly informed, already, on the average, has never paid more than 4 per cent.; therefore it stands to common sense that introducing a new company would be prejudicial to the interest of the inhabitants of Hanley. If it has taken the British Company 30 years to reach 10 per cent. dividend, I should say it would take both companies double the time to reach the same amount. I cannot say why the manufacturers have not introduced gas into their factories. I employ about 500 hands, and it is introduced into every part of my manufactory. The piece-workers pay for their own gas—every man, I think, pays about 4d. per week. The gas was put on years ago, and it has worked satisfactorily. In fact, the workmen who use gas would not put up a lamp if they were wanted to. It was 4s. 6d. per 1000 when I had it laid on. It would equally have suited the purpose of other manufacturers if the work-people were willing to pay. There is no distinction between my factory and the others. I paid for the fittings, and it suited my purpose to do so. I became a shareholder in the British Company after the division of the districts. I did not think it was safe before, but after they got their Act I took

shares. I also became a shareholder in the Burslem Gas Company—not the Tunstall Company.

Cross-examined by Mr. LLOYD: I have 100 shares in the Burslem Company. I dare say I have 107 £20 shares in the British Company, but I cannot exactly tell the amount. I purchased them after 1858. I do not know whether they would depreciate in value if this bill passes, but I have no intention of selling them. I remember a meeting of the council in 1858, at which the question of a petition against the Stoke Company was discussed. I do not recollect that Alderman Wedgewood said it would be an advantage for the the Stoke Company to bring in their mains, and my saying the council only wanted a guarantee that they would come; that that would excite competition, and that I did not see why Hanley should not have two gas companies. I do not believe I ever gave such an opinion. I have no doubt I voted against the petition. At the time I was chief bailiff I was aware of what was going on, and I still say there were no complaints about the quality and price of gas. I was a commissioner at the time the question arose about the lamps being left unlighted. I was a commissioner 20 years before the transfer, but do not remember any complaints about the company refusing to extend their mains.

Mr. LLOYD read a memorial, adopted at a meeting in December, 1863, from the corporation of Hanley to the company, complaining of the high price of gas, and requesting a reduction.

Witness: I remember that I did state that they did complain about price then, and it was reduced from 4s. 6d. to 4s. 3d.; but the council asked them to reduce to 4s., which they afterwards did, but not at that time. That is the only complaint I ever heard, to the best of my knowledge.

Mr. LLOYD: Can you account for the fact that scarcely any other factory has introduced gas?

Witness: They will not go to the expense of putting in fittings, and therefore the men cannot use the gas; but if the manufacturers would put in the fittings the men would very cheerfully pay for the gas and for the interest of the fittings. I should think Mr. Wedgewood could have afforded it if he had chosen. The communication on the reduction of price in 1864 was done by the Lighting Committee; I was not on that committee. I know some of the British shareholders in the district, but not all of them. I think Mr. Boothroyd is, and also Mr. Challoner, but I cannot say.

Mr. LLOYD: I understand your idea about taking shares was, that you would not take shares in any gas company unless it had a monopoly?

Witness: I never had a share until the division of districts, and now I hold shares in other companies in London, which I have purchased since the districting. I would not touch a gas share previous to that, but it is impossible to say what I may do.

Re-examined by Mr. MACKESON: The British Company reduced the price to 4s. 3d. on the 1st of January, 1864. Since then it has been reduced to 4s., but I do not know whether it was in June, 1864, or the beginning of 1865. I do not know whether it was without any further solicitation from the Lighting Committee or not, because I was not on the committee. Since then they have reduced the price to 3s. 6d., which gives general satisfaction.

By the COMMITTEE: The workmen pay about 4d. a week each, apprentices in their fifth year 3d., the women 2d., and the little boys 1d. There has been no alteration to the present time.

By Mr. MACKESON: Our gas was 4s. 6d. when these payments were adopted, and there has been no difference made since.

Mr. *Benjamin Boothroyd*, examined by Mr. MACKESON.

I am an alderman of the borough of Hanley, and have resided there for 30 years, during which period I have consumed the gas of the British Company. The supply has been satisfactory, upon the whole, and the price moderate, compared with our neighbours, the cost of coal, and other circumstances. Before this new company came in there was no more dissatisfaction than public companies usually meet with. There are people who are always dissatisfied with everything about them. The dissatisfaction presented itself after the appearance of some letters in the *Sentinel*, which was immediately preceding some steps taken for the introduction of Mr. Hedley and some others to the borough to get up an agitation and introduce a new company. The charges were, that gas was sold cheaper in other towns than in Hanley, and that it could be sold at 2s. 9d., leave a larger profit, and be of better quality. The case of Walsall was cited as supplying 16-candle gas at 2s. 9d., leaving a large profit. I went into the accounts thoroughly, and found the statement, as far as Walsall was concerned, untruthful; and that, instead of realizing a reasonable profit upon its plant, it was not realizing a reasonable return for making the gas for its own benefit. The dissatisfaction does not exist to the same degree in Hanley that it did. It is not entirely done away with, but is gradually subsiding. If the public could ensure 3s. 6d. per 1000 cubic feet for 13-candle gas, I believe they would be satisfied. They are satisfied that the introduction of a second company with a second capital would be a great and permanent injury; and I instanced Sheffield, and proved that town was now paying £10,000 a year more for its gas than if it had only had as much money expended as the British Company have expended in proportion to the population. The price at Sheffield is 3s. 6d., but Sheffield is a large place, and there is a large consumption. Its population is about 185,000. The reason why workmen do not use gas is, in my experience, because they work by the piece, and can light themselves at very little expense by the ordinary candle. The expense of fittings, too, would be considerable, and the manufacturers think the expense would ultimately fall upon themselves. I am a surgeon, and go amongst the men frequently. The company are willing to waive the six hours notice with respect to testing the illuminating power of the gas. Offers were made by Mr. Haswell to that effect about two years ago. The company have asked the corporation to be present at the testing of the gas by the photometer. I am the owner of cottage property in Hanley and Burslem; and I think, if gas-fittings were to be at the risk of the owner it would be very unlikely that any owner, knowing the care cottage people took of property, would ever introduce it. It would be sure to be a loss to them. My experience is the same as to water. I certainly lose upon my water, the fittings especially. Although I charge a rental, that does not cover the cost to me. I have scarcely a tenant who would give himself any trouble in winter to protect the fittings against frost, and, therefore, I have every year an expense on account of the repair of broken pipes, and so on.

Cross-examined by Mr. LLOYD: I have heard complainings, and I hear the same of everything where I live. We contract with the company for the public lights, and I believe a contract is never entered into without an attempt is made on the part of the Lighting Committee to obtain better terms for the borough. I never made speeches except in my proper position as a member of the Town Council. I did not speak at the public meetings. There were some who did not wish to be convinced, as they had an interest the other way. I have always been anxious to have gas sold at the lowest possible price; and was the party who moved in the Town Council that we should have a meter inspector appointed, to satisfy the consumer that his meter was registering correctly. When we consider the price of gas, we have to consider the circumstances under which the gas is made. In Hanley, the gas companies labour under some disadvantages—there is a bad market for coke, and the company sustains considerable leakage, no doubt, from the fracture and dislocation of its mains. I estimated the leakage at 25 per cent., and was confirmed by Mr. Copland. At one time it was 30 per cent. In the course of my experience I have seen mains completely broken across through mining operations.

By the COMMITTEE: We have mining operations going on under almost every street under one-third of the place.

Cross-examination continued: The last fracture I saw was of a 6-inch main, in Hope Street, about six weeks ago.

By the COMMITTEE: These mining operations take place within 50 or 60 yards of the surface. We are in the very centre of the North Staffordshire coal-field.

Cross-examination continued: In spite of this I might have said, in Nov. 1863, that there ought to be a reduction. I do not say that 3s. will not pay. I never said so; that is a question for other people to determine. I speak of the loss, and I say that these things should be taken into consideration, when you say what will pay. Mr. Stevenson did not appear to take them into consideration, or did not know what the price of coal was; and with respect to other losses, he did not take the trouble to ascertain them.

Mr. LLOYD: What was the offer you say was made two years ago by the manager?

Witness: I first of all suggested that there was an Act of Parliament passed giving authority to public bodies to appoint a meter inspector, and I suggested that the Lighting Committee, of which I am not a member, should take the necessary steps to have a meter inspector appointed for the borough. After a short time I inquired whether this appointment had taken place; at a subsequent meeting I found that it had not been made, and upon making further inquiry I found that we had allowed the period to elapse within which the appointment should have taken place. I said, at any rate, if we could not appoint a meter inspector to protect the consumer against anything wrong, and set them right in that particular, we ought to have a photometer put in our town-hall, in order that we might be satisfied that the proper illuminating power of the gas was maintained in the borough. This appeared in the newspaper report, and the next time I met Mr. Haswell he told me they had a photometer at the works, and that it would be very much at the service of the corporation whenever they liked to come down. I said, "You have a notice required under your Act;" to which he replied, "You need not mind anything about the notice, but you can come down at any time you please, and bring any one you like with you, and be able to judge of the gas for yourselves." I mentioned that matter to the Lighting Committee, and to the best of my recollection I mentioned it also to the Town Council; and that is all I know about it. This occurred two years back, before the agitation commenced about the new company, and shortly after the passing of the Act.

Mr. LLOYD: Let me read you the minute of December 10, 1863:—"It was moved by Mr. Bradford, and seconded by Mr. Pidduck, that the question of a photometer, and the appointment of an inspector of meters, be referred to the Lighting Committee, who are to report thereon at the next meeting." That is the time you are speaking of?

Witness: I am not quite certain when it was; it was when the matter was referred to a second time. I mentioned the matter soon after the Act was passed.

Cross-examination continued: I have 28 cottages in Burslem, 4 in Hanley, 2 houses of a somewhat larger size. I had more, but I sold several; and I also manage my brother's property. They are a small class of house in Burslem, letting for about 2s. 2d. per week. I have converted two cottages in Hanley into shops, in which gas is used. I have been a shareholder since 1858, and think I have made, on the whole, about 7 per cent. The last year and a half they have paid me 10 per cent.

Re-examined by Mr. MACKESON: There were nine independent men voted with me in the council; and out of the twelve on the other side there were eleven shareholders.

Mr. *William Huston*, examined by Mr. MACKESON.

I am a wine and spirit dealer in Hanley, and a member of the council. I have been a member of the Lighting and Highways Committee for seven years continuously, and have been a keen observer of the gas supply all that time. We have had inquiries made, and have invariably found that we were as well treated in price as in other towns similarly circumstanced. The quality, I consider, is equal to anything around us, and rather better than surrounding towns in the Potteries. There were sub-committees appointed occasionally to see the lamps were kept burning, and when we found a defective lamp we gave information to the man who lit the lamps, or to Mr. Haswell, and I invariably found complaints remedied immediately after they were made. I have been a very strong advocate for a reduction in price, and now that is made I am decidedly of opinion that to introduce a new company would be injurious. One of the companies would purchase up the other, and then it is likely the price would be raised. I am not a shareholder in either company, and am the third or fourth largest consumer in Hanley. When I was a consumer at the previous place I occupied I was scarcely ever short in quantity, and the quality was satisfactory, though I should have liked the price lower.

Cross-examined by Mr. CHITTY: I attended a meeting of the Lighting Committee on the 24th of November, 1863, when a resolution was passed that the committee did not think the concession of 3d. per 1000 feet was sufficient. I wanted it down to 4s. I should be satisfied if the present state of things continued. Our committee has a written guarantee from the British Company that they will not raise the price above 3s. 6d. per 1000 feet. That guarantee was given within the last 12 months. This guarantee is simply a letter from the secretary, but I believe in the good faith of the company. Hanley is the central town in the Potteries. I cannot say whether it is likely they would set the price for the neighbourhood; but when the British Company lowered the price to 3s. 6d. they immediately lowered it at Tunstall. If one of two shops was to sell goods at a cheaper rate than the other, I should feel bound to support the cheapest; but I know from experience that if you introduce two companies to do that which one can do, it must, of necessity, have a tendency to raise the price instead of lowering it. I heard the evidence yesterday, and know the districts referred to; and my decided opinion is that the owners of that property would never introduce gas into those districts, as the population is constantly moving, and some of them might take the fittings away with them. I think it is generally cottage property which is unsupplied. The owners who live in their houses might take it, but the owners who let their houses would not take it to run the risk of paying for it.

Mr. CHITTY: How do you account for the owners of cottage property coming here in large numbers and saying they will take it?

Witness: I cannot account for it. I cannot form opinions for other people. I think it is supplied cheap enough. Assuming that there are 1300

undertakings to take the new company's gas, I think a good deal of pressure has been put on. I do not wish to say more than that.

By the COMMITTEE: The company wanted us to enter into a guarantee with them for three years; but we, as a Lighting Committee, refused to enter into a contract for more than one year, and the company readily acceded to us. In fact, I may say they gave us nearly all we asked.

Mr. CHITTY: The question asked by the noble lord was as to the guarantee not to raise the price beyond 3s. 6d. Was that to be only three years?

Witness: They have given us a written guarantee that they will not raise the price of gas for private consumers above 3s. 6d.; that is what I understood.

Mr. MACKESON handed in the following letter:—

The British Gaslight Company, Limited,
Office, No. 1, George Yard, Lombard Street, London, E.C.,
March 1, 1865.

Edward Challoner, Esq., Town Clerk, Hanley.

Dear Sir,—I have reported to the board the interview I had with the Lighting Committee of the borough of Hanley, on Wednesday evening last. I am now desired to say that the directors will supply the public lamps in the borough of Hanley, from the 1st of August next to the 31st of March, 1866, the lamps to be lighted every night, burning from sunset to sunrise, and to consume on an average 5 cubic feet of gas per hour; light, clean, and extinguish, paint and keep the lanterns in repair, and paint the lamp-posts once in every two years, for the sum of £2. 15s. each lamp. I am also desired to say that the directors pledge themselves to a maximum price of 3s. 6d. per 1000 cubic feet for gas supplied to private consumers, and to a maximum price of 2s. 10d. per 1000 cubic feet for gas as the basis of calculation for public lighting. That the maximum illuminating power of the gas shall be of such quality as to produce, from an Argand burner having 15 holes and a 7-inch chimney, and consuming 5 cubic feet of gas per hour, a light equal in intensity to the light of 14 sperm candles of 6 in the pound, burning 120 grains per hour, unless prevented by frost or other unavoidable cause or accident, or during any necessary repairs; and that the directors forego their right to six hours notice prior to the illuminating power of the gas being tested by an inspector appointed by the Town Council under the provisions of the 21st section of the Staffordshire Potteries Gas Act. I am further desired to say that a discount of 5 per cent. will be allowed on the gas supplied by meter to the public buildings of the borough under the control of the Town Council. I am, dear sir, truly yours,

FREDERICK L. LINGING, Secretary.

Mr. *George Bradford*, examined by Mr. MACKESON.

I am a draper in Hanley, and the occupier of four shops. I am a member of the Town Council, and of the Lighting and Highways Committee. I am also on the Markets Committee, and last year I was on the Board of Guardians. My business requires a good light. I have been supplied with gas by the British Company ever since I commenced business, and am thoroughly satisfied with it. I do not find better gas when I go elsewhere. My opinion is that it would be decidedly disadvantageous to the general public to have two gas companies, because I consider that one company is quite sufficient to supply any quantity of gas that is consumed in Hanley, or that may be consumed. Perhaps there is no man in Hanley who has a better opportunity of knowing the various opinions of the tradesmen generally in that district than myself; and I may say, that since the gas company have decided to reduce the price to 3s. 6d., there is perfect satisfaction, as a rule, among those who are independent; of course, those who are, to use the term, "fighting the battle," fight it still, but to a large majority, even of their shareholders, it is satisfactory.

Cross-examined by Mr. RODWELL: I think 3s. 6d. a fair price under the circumstances. I took steps to have it reduced from 4s. 6d. I certainly should like to get gas at as low a price as possible, and think those who complained of the high price were justified in doing so. During the last six months I have been satisfied with the quality of the gas, but previous to that there were times when we had not sufficient power.

Mr. *Samuel Cole*, examined by Mr. MACKESON.

I am a glass manufacturer at Hanley. I am a Town Councillor, and a member of the Lighting Committee. I have been a large consumer of gas for 17 years. Light is particularly required in my business. I have had no reason to complain of the gas supplied by the Hanley Company, nor ever heard any complaints from others. I do not think there is any necessity for a second company in Hanley.

Cross-examined by Mr. RODWELL: I do not like paying 4s. 6d. if I can get gas for 3s. 6d. I have no doubt I have told my neighbours that the reduction has been made through the introduction of a new company.

Mr. *James Rogers*, examined by Mr. MACKESON.

I am lessee and manager of the Hanley, Lichfield, and Worcester Theatres. I believe I am the largest consumer of gas in Hanley. The quality of the gas has been very satisfactory; I have never had reason to complain of it. I have been satisfied with the price, because I have paid more elsewhere. It was cheaper compared with Worcester and other towns. I have not seen any difference in the illuminating power during the last six months. Had there been any I must have noticed it, because, as my profession depends so much upon gas for certain effects, if the gas were not giving a steady light I must have noticed it, or my attention would have been directed to it by the men employed to look after these matters.

Cross-examined by Mr. RODWELL: When I was a gas consumer at Liverpool, prior to going to Hanley, which is now twelve years ago, I paid as much for it as I did when I paid 4s. 6d. at Hanley. At the present time I have no connexion with Liverpool, only with Lichfield, Worcester, and Hanley. The only difference I have found in the gas during the last six months has been in the price, and that is a pleasing difference.

By the COMMITTEE: I have no means of testing the gas, but the effects produced in a theatre by the footlights and sky borders are of such a nature that we have to put on extra light for producing certain scenic effects. If I did not perceive it myself, the party employed would inform me, "The gas is very bad this evening," or something of that kind.

Mr. *James Carter*, examined by Mr. MACKESON.

I have been master of the Hanley School of Design for three years, and have resided there during that time. I have used some 21 or 22 burners of a large size, and three rings of light, one 12 inches in diameter, and two 6 inches. It is essentially an artisan's school, and consequently held in the evening, during the gaslight. It is for two hours each night for five nights a week, and during part of the period for three hours on the sixth night. The school has been highly successful in competitions; and the works for the competition, which takes place in February, have to be executed during the dark months of October, November, December, and January, almost entirely by gaslight, and, when compared with daylight, it is a very severe test. The whole of our success depends upon the amount of light, and the good quality of light. We require, in the first place, a steady light, and, if possible, a concentrated light—that is, from one source. A ring of light is very suitable for our purpose—a very steady light, as clear and colourless as possible, because in the various stages of instruction we are compelled to introduce colour more or less. For fifteen years I have been in the habit of painting by gaslight; but of course I do not place gaslight against good daylight, as that would be simply ridiculous. Comparing Hanley with other towns I have been in, I am of opinion that the gas was quite up to the average. I have not noticed any alteration in the illuminating power during the last six months.

Cross-examined by Mr. CHITTY: I have not observed any alteration in the gas within the last year. In the elementary class for mechanical drawings the lights are low down, and the pupils are arranged in desks; but in the advanced classes the pupils work on easels.

Mr. CHITTY: Are you aware that the general illuminating power of gas in Lancashire is 20 candles?

Witness: It is impossible for me to enter into the scientific part of the question; I only judge by the eye. It would not shake my belief in the Hanley gas if I found one was giving 20 candles, and the other only 10.

Mr. *J. L. Wyatt*, examined by Mr. MACKESON.

I have been a watchmaker at Hanley for 25 years. I do the work myself, with the aid of my son, both by daylight and gaslight. The gas has always been good enough for my purposes. I never heard any complaints till lately. I want plenty of good light; I cannot do without it. I have not noticed any increase particularly during the last six months, but I have always had a good and sufficient supply.

Cross-examined by Mr. CHITTY: I was working during the months of November and December last, but did not notice any increase in the quality, because there was always sufficient for my purpose, and I did not bestow a thought upon it.

Mr. CHITTY: Will you be surprised to find it running in this way:—November, 7·30 candles; January, 10, 11, 12, 10·75 candles; February, 9·76, 16·25, 17·14, 17·65 candles?

Witness: That might be; but I always had sufficient for my purposes, and, of course, that is all I can speak about.

Mr. *Ralph Hailes*, examined by Mr. MACKESON.

I am an engineer and surveyor, residing at Cobridge, in Burslem, for the last 25 years. I have been surveyor to the Burslem Local Board of Health for 15 years; to the Tunstall Board of Health for 10 years; and to the Burslem, Norton, and Newcastle turnpike roads, for 12 years. These roads comprise the main thoroughfares of Burslem and Tunstall. I have had large experience as to the damage and annoyance from gas-mains. The district is a mining district, and the working of the mines causes subsidence of the roads, and breakages of the mains repeatedly. There are mines in course of working now, and there is a large unopened field also. The subsidence takes places sometimes very suddenly; the road comes down a considerable distance in a short time. I have seen the mains lifted several times between Cobridge and Hanley, the roads having sunk several feet. The houses have been damaged in various parts of the borough. The infirmary has been damaged for many years. I have known escapes of gas upon the road from Cobridge to Hanley. I am of opinion there ought not to be two companies in any district, and have been so for many years. Before 1858 there were two distinct sets of mains in Burslem and in Stoke, but only one in Hanley. In that year the district was divided amongst the different companies, Burslem was allotted to the Burslem Company, which obtained parliamentary powers in 1857; Tunstall and Hanley were left to the British Company, and Stoke was allotted to the Stoke, Fenton, and Longton Gas Company. There was competition before, but then each company was limited to its own particular district. The several boards petitioned Parliament in favour of the districting. With regard to cottage property I think very little gas would be taken. There might be in a few cases where parties possessed their own houses, but a large owner of cottage property would not introduce gas into his cottages. I am agent for 60 houses in Hanley, and others in Burslem, and I agree with Mr. Boothroyd upon the subject. I think the works are quite efficient, and capable of supplying any present or probable future requirements of the borough. Until recently I have heard very little complaint. The British Company have lighted Tunstall ever since I have been surveyor, and they have met us on the most liberal terms. We have had reductions without asking for them, and they have extended their mains whenever we have erected public lamps. Sometimes we have had extensions for nearly a mile where there has been very little property upon the road, but they have never made complaints, and have readily extended their mains as soon as the orders have been given to put up additional lamps. With regard to the repairs of the roads—which is a knotty question—they have generally met any complaint in the most liberal manner.

Cross-examined by Mr. CHITTY: Tunstall is supplied from the parish of Burslem, at Brownhills; it used to be supplied from Hanley. The price at Tunstall has been the same as at Hanley. The population of Tunstall is a little over a third that of Hanley. I think the British Company have dealt very liberally with Tunstall in reducing the price to the same terms as at Hanley. I can recollect the price being 12s., and there were not very great complaints then. If there is a broken pipe it soon discovers itself by the smell. Our leakage has been considerable, but I cannot estimate the quantity. I have not had any experience in gas matters, but merely looked over the works as to use. I should think 12 per cent. was a small amount for leakage. The owners of small property pay the water-rate, and a very heavy burthen it is. The owners pay for the water and charge it upon the tenants.

Mr. CHITTY: Would you be surprised if they should take gas in the same way?

Witness: Water is compulsory, and gas I anticipate would not be. You are compelled to have water in houses under £10 rent, and the landlord is compelled to pay for the supply. The Staffordshire Potteries Water Act, which authorizes that, applies to all the district. The mining operations have drained all the wells in the neighbourhood, and that practically compels the landlords to have water in the houses. I wish to make a little explanation as to Burslem. The arrangement was this: Burslem had the power to light Tunstall as well, and the arrangement come to was, that the Burslem Company was shut out from lighting Tunstall, while the Tunstall Company was shut out from lighting Burslem. The Stoke Company had Stoke, Fenton, and Longton allotted to them, and the British Company were shut out. In Longton there is competition still, but I should not say it has proved beneficial. I do not know what dividend the companies pay.

By the COMMITTEE: They have had a lawsuit or two—that is a disadvantage; and then they have the streets cut up, and serious disturbance of the pavements and footpaths by laying down the mains of the new company.

Cross-examination resumed: The old company indicted the new one, which had no parliamentary powers. The new company still remains, but I do not know that they paid last year 13 per cent.

Re-examined by Mr. O'MALLEY: Before going to Parliament, Burslem had powers to light Tunstall and Burslem, and the Stoke and British Companies were seeking powers for the whole of the pottery towns. They had rights interchangeably over a common district, and they interfered with one another. The result of the investigation was that each was restricted to a particular district. When a leakage takes place, it is very difficult, without opening the ground, to ascertain which company's pipes are broken.

The CHAIRMAN said it was unnecessary to offer any further evidence as to the inconvenience of breaking up the streets.

Mr. *Wm. Woodall*, examined by Mr. MACKESON.

I am a civil engineer. I am engineer, secretary, and general manager to the Burslem and Tunstall Gaslight Company, and have been so since September, 1855; and, previous to that, seven years with the Liverpool Gas Company and Liverpool United Gaslight Company. I concur in the evidence given with reference to the effect of two gas companies in one district. I think it is the worst thing possible, in the interest of both consumers and shareholders. During the three years competition, when the mains of the two companies lay side by side in the district of Burslem, the loss by leakage was more than 35 per cent.; we have now reduced that leakage, having the supply to ourselves, to 17 per cent. I have no doubt, if the duplication of mains was resumed, the effect would be the same. I know the works of the British Company, and think that company have remarkably well managed their property. I think at the present moment the works are in a state of efficiency for a largely increased consumption. The system of carbonization, purification, and exhaustion are as good as may be. I was surprised to hear the capital account is only £33,000, although their establishment is in so good a position for a largely increased consumption. The consequence is, that they are in a better position than even a new company would be with a new plant. Their establishment is worked with remarkable economy, and with a due regard to future requirements. I have been constantly testing my own gas, and comparing it with the other gas in the district, and have no hesitation in saying the British Company's gas has always been particularly good. I tested in the usual way by photometer, by averages of two or three experiments following each other.

Mr. MACKESON: That is the usual way these experiments are made. What was the result?

Witness: I prefer confining myself to the experiments which have been made since the rival company has been in the field, making this additional remark:—I found then that the illuminating power of the gas supplied was 15 candles, judging it as accurately as I could, and I think I was perfectly competent to form an opinion on the subject. I conceived that the gas was no better, as far as I could judge by my eye, than it had been for the previous five or six years. I have used the Birmingham burner—the burner of my friends opposite—and I have made constant experiments, and I find that the burner gives a result decidedly higher than the other burners formerly used. When the companies were before Parliament in 1857 and 1858, we agreed that our gas should be equal to a standard of 10 sperm candles. I believe I am right in saying that we inserted what were then called model clauses. As a matter of course, 10 candles were then inserted in the Acts in the same way that 14 candles are inserted now, the difference being merely attributable to the difference in the photometrical burner. There is a difference of two or three candles between the old Argand burner and the new one, the Birmingham burner. The illuminating power would be in each case nearly the same. I think it is very likely that all over the kingdom gas companies have somewhat improved their process of manufacture, and they have had their attention more particularly directed to the quality than they had ten years ago. I think it is impossible to find a town large enough for two companies. I know, for instance, at Liverpool, which is a very much larger place than Hanley can ever grow to, that the experience there is decidedly in favour of the amalgamated company. As to the price of 3s. 6d., I believe the company has made up its mind to do with a smaller dividend for a few years, until it recovers itself. It certainly cannot pay 10 per cent. upon the old capital, and 7½ upon the new, at that price. I should say it would not earn more than 4 or 5 per cent.; so that the company sacrifice their dividend by lowering their price. They are entitled by the Act of Parliament, upon the capital which they have invested upon the works, to 10 per cent., and upon the additional capital invested since the passing of the Act, to 7½ per cent., and they have brought themselves up to a good healthy condition. They were earning that a year or two ago—but they have sacrificed in price of gas so much that I conceive it will bring their dividends down to 4 or 5 per cent. upon their capital until they have recovered themselves by an increased consumption. I will only say in explanation of that, that the experience of Liverpool, which has been referred to, is just this:—It is the principle of the Gas Clauses Act—which also applies to this company—that they are allowed to carry over, after paying dividends, a certain reserve; and when that reserve-fund is full, they are compelled, at the instance of any ratepayer, to lower the price of gas; and, in the event of the gas company refusing to do so, the magistrates must make an order for the reduction. The operation of the Act in Liverpool—which is not very far different from the state of the case in this instance—is just simply this, that, since 1856, the price has been reduced, step by step, by the simple and sole operation of these clauses, until it is now, I think, sold at 3s. 2d. per 1000 feet.

Mr. MACKESON: That is more than 10 per cent.

Witness: More than 10 per cent. they carry over to the reserve-fund. The year after the reduction it is usual for them to have to withdraw something from the reserve-fund, and therefore they have to put that back again.

Mr. MACKESON: If there are two companies here, would they ever arrive at that position, in your opinion?

Witness: No. I take it that when a consumption of 60 million is reached, if the British Company is left alone in the field, they can readily sell their gas at 3s. per 1000; but if there are two capitals—and it is proposed to double the capital by another company—that will put it off.

Mr. MACKESON: Now, you have heard the opinion as to the lighting of the manufactories with gas. What is your opinion with regard to the Potteries generally as to the consumption of gas amongst the population?

Witness: I may say that it has been a matter of great surprise to me that gas was not used in the Potteries, and I have taken a great deal of pains to find out the difficulty that stood in the way. I never in the whole course of my negotiations with the manufacturers ever met with the explanation that the price of gas stood in the way, because at £1 per 1000 it is much cheaper than candles, and at 4s. 6d. per 1000 a gas-lamp comes to the same price that a workman would pay for a candle at 1s. 8d. a pound. They both come to a farthing an hour. But while the manufacturers are ready to admit the advantages of it, there are so many accidental circumstances connected with it that they are ready to let the matter rest. It is not so much a question for them as for the workman. If it is worth the while of gas companies to let out fittings, it is worth the while of manufacturers to fit up their own workshops.

Cross-examined by Mr. CHITTY: The price is an obstacle to the use of gas by the manufacturers, notwithstanding what has been said by the manufacturers who have appeared here. As to what Mr. Wedgewood has said, I can only say the manufacturers in Burslem have found it worth their while to introduce it ever since the gas-works have been introduced. The circumstances of Burslem and Hanley are precisely similar. The works are there admirably suited to the supply of a great deal more gas, but I do not admit the fact that there is a very small consumption. You have not brought any comparison that fairly would bear as a parallel case. Hanley is inhabited by persons renting very small tenements, and their tenancy is of the most fickle kind. I am not aware that the objection has been raised by the company that in testing gas they ought to be allowed to use the burner most favourable for their purpose. I believe the companies are willing to use the Birmingham burner. I think it is very likely that anybody who has tried to burn 5 feet an hour of gas through the Birmingham burner will confirm my evidence that it is not to be done. As to the value of 15 candles, I made my test in April last. I prefer not to quote the figures of my previous experiments. I think the 15 candles was a fair average specimen. The companies are bound to publish an annual account in order that the consumers of gas may see how they are spending their money. I produce a copy of the Burslem Company's account. We print every figure relating to our business, and circulate it freely. It is an abstract of our books. I think the consumers would be able to form an exact opinion of the state of their affairs from the British Company's account. The local authorities can employ an accountant to see what the company are doing with their money. Their accounts show their expenses are £7626, and the income £11,341. I do not mean that an ordinary gas consumer can see from this account what was being done, but I say the British Gas Company state, on this account, that their income is so much and expenditure so much. It is true there are no details, but that is of very little consequence. Our company furnishes a detailed account, and the London companies furnish a similar one. But I say it is open to the gas consumers to appoint an accountant to investigate the accounts furnished by the British Company at Hanley. It is done at Liverpool. If the company keep the price at 3s. 6d. they will not make more than 4 per cent. as long as the consumption keeps at its present rate. I do not think they will increase the price. I think the reduction will increase the consumption.

Thomas Hawksley, Esq., C.E., examined by Mr. O'MALLEY.

I am a civil engineer in very large practice, especially with respect to gas and water works. My experience extends all over this country, and to places beyond. I am in the habit of laying out works, superintending the operations of companies when established, and of advising new companies as to the probabilities of success. I have not been down to Hanley during the time that this conflict has been going on, but I know the works very well. I have not been down to the works for three or four years, but I made a very thorough examination of them about three years ago. I was consulted as an engineer in the arrangement of 1857, but not, I think, upon that particular bill. It was upon the general affairs of these companies. I have heard the statement of Mr. Copland with respect to these works. Both the sites are very good indeed. From my experience, I am able to say that a well-regulated gas company work best for themselves and most to the interest of the public when they have the whole district to themselves. There are numerous instances of that fact, beginning at London and extending down to very small places. I make a point of not taking up cases of opposition, simply for this reason, that in the other cases that I am concerned we have a state of facts which are opposed to the purpose and objects of competition companies. I cannot blow hot and cold, and therefore I avoid those cases. Since 1860, we have known no instance of a competition company being sanctioned by Parliament. Attempts have been made from time to time, which have been defeated. The districting system works well in London, but the value of it is not yet entirely developed, because, in consequence of the ruinous competition to which the companies were exposed before that Act was passed, there were enormous arrears on dividends, which are now being made up from the extra profits consequent upon the metropolis being divided into different districts. As soon as those arrears of dividends are paid off, the price of gas will go down very largely. There has been throughout England a very great reduction, on the part of the companies, below the maximum price. This has been done voluntarily in this sense: the Gas Clauses Act being held over them has impelled them to make reductions before the time when they would have been obliged to do it; but in that way the companies have been able to avoid litigation. In the earlier history of gas companies prices were very high, and many companies paid very small dividends. The Legislature generally allows 10 per cent. on the old capital, and 7½ per cent. on the new. I do not think that that is an unreasonable profit for the companies to make, because we know that 10 per cent. is not worth more than 7 per cent. There are very few old companies that have realized 10 per cent. for the whole period of their existence, until they came to Parliament to get an extension of capital. I have known instances in which, two companies occupying the same ground, when a leakage has taken place, the necessity has arisen for both companies to open the ground at different times. I will give this remarkable illustration of the evil of it. Being a gas and water engineer, it has come within my experience that it frequently happens gas and water pipes have become confused. I have known a gas company to lay its service on to a water-main, and when the tap has been turned on, water has been ejected through the burner like a fountain, instead of gas. Inconvenience might more easily take place between two rival gas companies, because you could not detect the error as you could when one main was for gas and the other for water. When there are two gas companies, if a consumer changes his gas supply for any reason, the practice is to put a cap on the end of the service-pipe, leaving it ready to supply him again in case he should change his mind and return to the old company. The leakage is increased in consequence. The ordinary leakage of a gas company is generally through the service-pipes, which are more oxidizable than the mains. In the winter quarter of 1864 the leakage of this company was reduced to 12 per cent., while upon the average of the whole year it was 15 per cent. The reason of the reduction was this: that a larger quantity of gas was passing through the same main in the latter half of 1864, and the more gas you pass through the same main the less proportionately as measured by per centage will be the quantity of leakage; therefore, if they have two sets of pipes to perform the service, the leakage must form a much larger proportion or per centage to the whole quantity of gas supplied. Hence the districting of London has been so serviceable to the companies as well as to the public, by reducing the quantity of leakage. Another important consideration in reference to a second company being permitted to be established, is the doubling of the capital required in the supply. It is to the great interest of the consumers that there should be as small a capital entitled to dividend as possible. That has been obviously the case since the incorporation of the Gas-Works Clauses Act, because the consumer can now compel the company to reduce the price. The way in which it operates is this: that as soon as the limit of the dividend is reached upon the smaller capital the price must be reduced, but if the capital becomes exaggerated by the employment of two capitals in the same field of operation, then of course the maximum dividend on the two capitals is not so soon reached, and consequently the consumers power to compel a reduction is so much longer deferred. There is also the separate question of management, which amounts to a very considerable sum in the year. And in the case of competing companies, the two managements are of a more extensive kind, and for this reason the rivalry between them re-

quires them to have more officers and servants. They have also canvassers and workmen to look after leakages, because where there are two companies pipes in the street it is difficult to know which pipe is leaky. I have not generally found it in my experience that an old-established company has succumbed at once to competition, but I have known cases in which competition has been carried on for a number of years, and then, as soon as the angry feeling has died off, there have been negotiations, which have resulted in amalgamation. As soon as the angry feelings have died away they make some arrangement. The amalgamations are not always on the best terms for the public. The best instance is that of Liverpool. In 1846, a new company was proposed (that being the third company); they came to Parliament for an Act; Parliament inquired into the whole circumstances, and insisted upon this, as the condition of throwing out the bill of the new company, that the two old companies should amalgamate, and come with a united bill next year, and that the price should be reduced as a condition of that amalgamation, and that clauses should be inserted in that bill by means of which the price should be afterwards gradually still further reduced. That was done, and now Liverpool enjoys a supply at, I think, 3s. 2d., whereas before it was 5s. 6d. Sheffield is another notable instance, but not precisely of the same character. With respect to gas-fittings, the internal fittings of damp places like those of the Potteries are very perishable, but as a general rule the internal fittings in houses and shops are not perishable, except the meters, which are very perishable, and their renewal costs a large sum of money. Burners I throw out of the consideration, because their cost is so small. I do not consider that 7½ per cent. on the cost price would be a remunerative sum for supplying fittings, and I have never heard of such a sum. If you are to include the meters, I do not think it would be a fair or just principle of commerce for a company to be supplying gas-fittings at a loss. Their shares would suffer from that operation. It is all very well in the first instance to hold out these inducements, but by-and-by it begins to tell upon the property. I do not think it is a legitimate mode of investing money; and, besides, there is one important thing which I should like to mention, and that is, that the gas-fitters all over the kingdom are opposed to this mode of interfering with their private trade. I have had a great deal to do with that subject, and I always advise every company I am connected with not to deal in fittings, because I think it is an improper interference with public and general trade. I cannot say it has been the habit of companies to supply fittings at cost price; I do not myself know an instance of it. The company being entitled to divide 10 per cent. on their whole capital, I think it would not be of advantage to the public, who are entitled to a reduction after 10 per cent. is reached, that they should make up out of the gas revenue the difference between 7½ per cent. and a reasonable price on their fittings. The result would be this, that those persons who took their fittings on hire would be the gainers, and those persons who fitted up their own establishments would be the losers; the public would have to pay for it, of course. I look upon that as one of the *ad captandum* clauses which are sometimes introduced into bills for the purpose of obtaining factitious support. I know so much of local agitations that I am not surprised at anything of the sort. People who desire to get a footing must hold out some inducement, and if they did not propose to do something which the existing company did not do, they could not hope to succeed. Apedale coal is a fair coal for gas purposes, but it is not the best. Mixed with a per centage of cannel coal, and when manufactured at the rate at which this company manufacture, to give about 9000 feet of gas per ton, it will produce a gas of an average of 13½ to 14 candles. That can be increased by the use of a larger per centage of cannel coal. I have had great experience in photometrical operations. With respect to the Birmingham burner, when it is applied to gas of high quality it is a failure, that is to a 14-candle gas-burner, and it develops the light of a gas that contains as much carbon as will give a light equal to 14 candles. But, if a company should be supplying a gas of 16 candles, that burner will not exhibit the whole amount of the light that is contained in the gas. What I wish particularly to express is this, that the burner does not create the light in any degree. It may repress the light by not admitting a sufficient quantity of atmospheric oxygen to the flame, or by admitting too much to the flame—that is to say, by not being properly proportioned to the quality of the gas—but it cannot increase it. It is just like any excise question. Assume the case of wine, you may by a bad process not discover the true quantity of alcohol that there is in a particular quality of wine, but you may by a better process discover that true quantity. As a matter of course the excise would be entitled to the best mode of ascertaining it. So in respect to gas, the carbon is the alcohol of the gas, so to speak, and all we have to do is to ascertain by the most perfect means we can, what quantity of carbon the company sends out in its gas, because carbon is the vehicle of light; it is not the light itself, but by ignition in a proper manner it becomes the vehicle of light. We have here a remarkable instance of a burner conforming to the ordinary description of a parliamentary burner [producing a burner]. This a 15-hole Argand burner, the oridinary kind of burner described in most Acts of Parliament, but it is so badly proportioned that, with 12-candle gas it gives the light of 3 candles. Here is another burner also conforming to the Act of Parliament, but better proportioned, which will develop the light of 14-candle gas and show it to be 14 candles. In testing the quality of gas by the photometer, it requires that the operation should be made by a person of experience, and by trying a number of burners till you discover the one that is adapted to the particular quality of gas. It is just as I have described before, it is the same as discovering the true per centage of alcohol in a bottle of wine. You do not put a per centage of alcohol into the bottle of wine; you only find what is there. Ascertaining the quality of gas is a very delicate operation by that means, but it is one that is easily acquired. I do not think the experiments of a man who had no experience could be depended upon. You might deceive him in a minute. If you took him out of the room and brought him back again without effecting any change, except by simply altering the position of the disc, he would not, if he tried the gas again, come within two or three candles of the same result. Still it is not a very difficult thing to acquire; but the eye must be educated, and a man requires proper experience and instruction. There are a great number of nice adjustment required; first of all, the meter must be adjusted to deliver precisely 5 cubic feet in a minute, neither more nor less. The pressure of the gas must be properly regulated so as not to vary during the time of operation. The burner must be adapted to the particular quality of gas to be tested. The disc must be of good quality, because and it is not of a proper and good quality, you cannot make a nice observation, and then the eye must be trained to perform the task. The candle has to be weighed, and not only that, it must burn in a particular manner; because if the candle tails off in smoke, as a matter of course there is too large a consumption of the *matériel* of the candle, without a proper development of the *light* of the candle. So at the other end of the photometer, if the gas tails off in smoke the same result follows with regard to it. I think a man ought to acquire such experience by dealing with different photometers, because the particular burner that he would use for different qualities would give erroneous results. I am acquainted with these works, and in my opinion the company have all the appliances necessary for meeting all the demands that are likely to result from a place like Hanley for several years; but there is no difficulty, as in the case of all gas companies, of increasing their plant provided they have ground enough to place that plant upon. It happens here they have two sites upon which, together, a million cubic feet a day could be made.

Cross-examined by Mr. CHITTY: I see no anomaly in comparing a London company with a small country company. Of course, a small district is, as a general rule, more expensive than a moderately large one; but if you have a very enormous district it becomes much more expensive. I should call Hanley amongst the smaller districts. I can only say, with regard to the difference of price, I have never found the public more satisfied at 3s. than they were at 8s.; the public never will be satisfied. London companies are now paying their full dividends and are clearing off their arrears. That is by reason of the smaller expenditure they are put to in consequence of the districting system. When they were in competition with each other they were really employed in ruining each other, and the public got no benefit. The mistakes I have spoken to as regards water and gas pipes would occur just as much if the pipes were required to be put 4 feet apart as without that precaution. My opinion is that consumers companies cease in a very few years to be consumers companies at all. Their shares get into other hands. People cannot live for ever; they frequently want money; they sell their unproductive shares to some one else, and get what they want. Consumers companies do not answer, in my opinion. No doubt large consumers can get advantage at the expense of smaller consumers by adopting the consumers company principle. I am not of opinion that the company is entitled to take that burner which is "most favourable to itself." A company cannot use a burner which is favourable to itself; that is utterly impossible. A burner may be used which is unfair to the company, because it will not develop the quantity of light that is in the gas. It is utterly impossible to make it too god. Usually, I should say, bat's-wing burners are used, and for this reason, there is no glass attached to them, and therefore there is no breakage. It was not the object of Parliament in defining a burner, to have one fixed standard; all that they wanted to provide was, that the gas should be burned with an Argand burner with 15 holes and a 7-inch chimney; it left every thing else to the discretion of the parties. With regard to the Birmingham burner, that undoubtedly was so, because that was the question raised there; but it was not so in the other cases.

Thos. G. Barlow, Esq., examined by Mr. BURKE.

I am a civil engineer, and am mainly consulted in reference to gas-works. I have been engaged in that capacity upwards of 30 years, and have myself erected above 50 gas-works in various parts of the kingdom. I was consulted by the British Company in reference to their works in North Staffordshire. I have inspected their works, both at Etruria and Brownhills. With regard to their capacity, the actual maximum daily supply during the past winter was 250,000 cubic feet from the Etruria works. They are capable of supplying half a million cubic feet, with a few additional retorts. At Brownhills works the maximum consumption was 75,000 feet per *diem*, and they are capable, with a small additional gasholder, of supplying 150,000 feet a day. The works are very well constructed, and admirably situated. If I had to construct them over again, I should adopt very much the same site and the same sort of works which now exist. I do not think, for the purposes of supply, at all events, that any additional works are at all necessary. The company are in a position to supply all the gas that could possibly be required in that locality for many years to come. I have had very considerable experience in working gas companies, and am conversant with the provisions and effect of the Gas Clauses Consolidation Act. From my experience of companies under those provisions I say they work satisfactorily for the public. I have known instances were companies being under that Act have reduced 30 or 40 per cent. the price of gas. I am conversant with the affairs of Liverpool with regard to gas-works, and I know that competition existed formerly. The corporation of Liverpool interfered to put a stop to the nuisance arising from the breaking up of the streets by the two companies, and the result was an amalgamation between them. The price of gas was then 4s. 6d. They are now charging 3s. 2d., and, besides that, they have made 10 per cent. dividends from the passing of the Act, and their reserve-fund is full. They are consequently reducing their rate. They are in Parliament now for an increase of capital, and Parliament has consented to that increase to the extent of £350,000. I am familiar with the provisions of the Metropolis Gas Act. It was promoted at the instance of the vestries and local boards against the gas companies. The bill was investigated by a committee nominated by the Committee of Selection, and Mr. Sotheron Estcourt was chairman. It was thought desirable in the interests of the public by that Act that there should not be competition between companies; it is recited in the preamble that it was "in order to economize capital." The bill was introduced, in the first instance, adversely to the companies by vestrymen, and certain restrictions are placed upon companies supplying gas. Since the passing of that Act I am not aware of the passing of any other Act in which competition has been sanctioned by either House of Parliament between two companies. There have been cases where the old companies were not under the Gas Clauses Act, but where they have been under that Act no case of competition has been allowed. The Birmingham Gas Act of last year was promoted by consumers, backed by the corporation, against the companies, and Parliament rejected the bill. Then this session there have been the bills of the Kent Company, the Exeter Company, and the Winchester Company, in all of which attempts were made by consumers to establish competition with existing companies, which have been rejected by the House of Commons. The Metropolis Gas Act provided for a maximum rate of 4s. 6d. I believe the companies have reduced the price to 4s. since then, and one of them to 3s. 9d. If this company will place themselves under obligation to adopt the provisions of that Act the public would receive adequate protection. I have known cases in which consumers companies have come to Parliament and bid with a low scale of charge, and then afterwards increased that rate. The Great Central Gas Consumers Company came to Parliament for the purpose of competing for the supply of the City, and obtained an Act in 1852. It was upon the faith of reducing the price to 4s. that they obtained that Act, and there was a clause in the Act to that effect. They afterwards said that the Metropolis Gas Act entitled them to raise their charge to 4s. 6d., and they did so. If the Great Central Company had not been established in the City of London the City Company would have been able to reduce their charge much lower than it is now; so that the public, by the introduction of that company, have had in effect put upon them the payment of interest upon a double capital and the raising of the price. That has been the result of the introduction of a competing company in the City of London. I have known other cases in which competition has resulted in a combination and amalgamation, which involves the payment hereafter of dividend upon a double capital instead of a single one. I have got a list here of 34 towns in which competition has existed, and in 27 of which

either arrangements or amalgamation have been come to. Reading is one in which competition ended in amalgamation—neither of the companies paid dividends satisfactory to the shareholders. In other cases I have known competition ending in the ruin of one of the companies. The City Gas Company were paying 10 per cent. or something more when the Great Central Consumers Company was brought out, but by the competition their dividends were reduced to 2½ or 3 per cent. Before the passing of the Metropolis Gas Act there had been negotiations going on for an amalgamation. The ground upon which the Great Central Company based their rise of price was, that the quality was so much improved; that under their own Act gas of 12 wax candles illuminating power was required, but that the Act of 1860 required them to supply gas equal to 12 sperm candles. The result of my examination, on the 17th of December last, of the gas of the British Company at Hanley, was that its illuminating power was 14·50 candles for the lowest, and the highest 16·62, the mean being 15·82. These photometric operations are very delicate, and cannot be conducted by inexperienced persons. Supposing the corporation have the power of testing the gas, and imposing penalties if it is not of a certain standard, the people of Hanley will have the same protection as exists in London. The present company is subject to penalties if their gas is not of sufficient illuminating power, and the proposed company could offer no more than that. I know Mr. Parker, and have full confidence in his investigations, and have witnessed some of his experiments.

Cross-examined by Mr. LLOYD: There have been 34 towns which I am acquainted with in which competition has been sanctioned. I think I may say in all these cases there would have been much less money employed in the supply of gas to the various towns if there had been none. I do not think the gas consumers, on the whole, have gained by competition, but there are instances in which the formation of a consumers company has been justified. I think the Act of 1847 gives all that is necessary for the proper regulation of a monopoly. I am not aware that during the last ten years gas companies have been put under more stringent clauses than those of the Act of 1847. The Birmingham Act of last year was an exceptional case. A gas consumers company introduced a bill last year for Birmingham. That was opposed by the two old companies, and I think there were complaints on the part of the promoters of the new company against the old companies. There were a great number of persons called to prove that both as to price, quality, and accommodation the old companies had done all that could be desired, and they generally expressed their satisfaction with what they had done. They competed in certain districts throughout the borough. One company had a bill of its own before Parliament at the same period with a view of placing itself under the Gas-Works Clauses Act. The other had not. There is no competition in price in Birmingham, there is competition of accommodation; they charge the same price, and supply the same sort of gas. The British Gas Company might have introduced a bill this session if they had chosen; it was a matter for their consideration whether it was advisable. If I had been consulted I should have advised them to apply for a bill of their own. I think the pledge which they have proposed to give will be amply sufficient to protect the public. I do not consider 38 millions per annum to be a very small consumption for such a neighbourhood. There are some manufacturing towns where 2000 feet per head are burned. Towns vary very much, and I know towns where the consumption is not above 300 feet per head, and others where it is 3000 per head. I cannot say that it struck me that the manufactories were imperfectly lighted with gas. I did not pay particular attention. I think it is a fair calculation that the consumption of gas will be double within the next ten years. I should say that has been so retrospectively for the last ten years, too. To give 10 per cent. dividend I think the price should be 4s. The effect of establishing a new company would be to lower the price for a time. The old companies would have to reduce to meet the competition. If it were left in the hands of one company I think the price might ultimately be brought down to 3s., and I think they might pay 10 per cent. I do not think they could make that dividend at less than that.

Re-examined by Mr. BURKE: I think 4s. per 1000 feet, on the present consumption, would be necessary to pay 10 per cent. dividend. The result of competition would be that each of the companies would go without dividend, if the new company started with 3s. per 1000 feet. That was the case with the Great Central Gas Company. It would have to end in amalgamation. Supposing the consumption to be doubled in ten years, the works of the existing company are adequate to meet that demand, with a very inconsiderable outlay. With an additional expenditure of £2000 they could double the present production. In Halifax they give a discount to large consumers, which reduces the price to 3s. 2d.; but then there are some of them which consume as much as one-fourth of all Hanley put together. Some of them consume 5 or 6 million cubic feet of gas a year. I am not lawyer sufficient to know what the operation of the pledge proposed to be given by this company would be, but I do not suppose the directors of this company, who have reputations to lose, would think of going back from what they undertake to do. In the case of the Birmingham bill, one company was prosecuting a bill for the extension of their area of supply; and, although those two companies were independent of each other, they did not compete as regards price. They canvass each other's customers; and the application, on the part of the consumers company, was based on an infinity of complaints against the existing company's price, illuminating power, accommodation, and everything. The bill was rejected. I believe that a well-regulated monopoly is the best thing for the public. Therefore the introduction of the proposed bill would do away with what the learned counsel has described to be the best thing for the public. As to the thirty-four cases of competition which I have spoken of, several of them are without parliamentary powers, and many of them were in existence before the Act of 1847. There may be certain cases in which there is a justification for a consumers company; but, looking to what the British Gas Company have done, and what they are prepared to do, I do not think there is such justification in the present case. With regard to these consumers companies, when it is a failing concern, shareholders get out of their shares, and it ceases to be a consumers company.

Dr. *Letheby*, examined by Mr. MACKESON.

I am professor of chemistry at the London Hospital, medical officer of health to the City of London, and gas analyst to the Corporation of London. I have held that office for thirteen years. I have heard the evidence of Mr. Hawksley, particularly on the photometer, Argand burner, and the illuminating power of gas. I agree, to a large extent, with the opinions expressed by him—without any material difference. I quite agree with what he says in this respect, that the burner does not in any way produce the light of the gas, and that companies are entitled to the best means of educing the light of the gas. I do not altogether agree with him that there should be a series of burners for bringing out the different results. It might be done in another way; but, in the main, we agree on the question that the burner in no way produces the light. To take the example of the Birmingham burner at the present time: it is suited for 14-candle gas—indeed, it was at my recommendation that that particular measurement was adopted; but, if the company give 15-candle gas, the burner does not show the light, and the company do not get the credit for what it gives. Instead of calling for another burner, the best way is to turn down the gas to its proper burning-point, and then you will get the desired result. The proportion can easily be obtained by a simple rule-of-three sum. If it is burning 4½ feet an hour, what would it be at 5 feet? It is quite a technical difference between us. There is no difference between my opinion and his in any other respect. With regard to the Hanley works, I have visited them, and had an opportunity of examining the supply and quality of gas in August and September, 1864. I made those visits without notice. We had to find the manager when we made the visit to the works. I went in company with Mr. Barlow. The works seemed to be carried on with very great care. All the newest appliances seem to have been adopted. I tested the gas at the offices of the company in the town. They are about 2½ miles from one of the works, and about 1 mile from the Etruria works. The gas supplied there is, I believe, the same as that supplied in the other parts of the town. I made five sets of experiments in the two days. The results were that the lowest illuminating power was 14·59 candles, and the highest, 16·42; the average, 15·66. I tested the gas also for ammonia, and found it to be remarkably free from it. It did not contain 1 grain in 100 cubic feet. I tested it also for sulphur, and found only 14·29 in 100 cubic feet. I paid a second visit to Hanley in February last. I then made four examinations at the offices. The lowest result was 14·12; the highest, 16·24; the average, 15·10. I also examined the gas at the Etruria works, and I found it was 15·56 candles; so that there was very little difference between that and the gas in the town. I used the best-constructed photometer and the best burner. If I had used the old Argand burner, the difference would have been 17 per cent. of illuminating power less. The burner which I used then had a measurement of 48/100ths of an inch. If I had used the old burner of 7/10ths of an inch, which I know is often supplied for photometers, the difference between the two would have been, in round numbers, 20 per cent. I saw the photometrical book of the company, in which the results were recorded of the previous days. The results agreed very closely; and, in fact, the appointed tester of the company, Mr. Parker, made experiments in my presence, and I am satisfied that he makes them well, and that they are reliable. He was present when I made my own experiments. Those results are better than the requirements of the Metropolis Gas Act of 1860, which requires only 12 candles. Here we have 15 candles, which is 25 per cent. more. Altogether the illuminating power and the chemical purity were very satisfactory. The test by the photometer is a very delicate test. It is exactly as Mr. Hawksley says. It is not difficult to learn, but when learned, true results are easily arrived at; nevertheless, it does require teaching. Supposing a candle were used in the experiments that was not proper for the purpose, an incorrect result would follow: the same with regard to the burner. The test ought to be made with sperm candles. There are sperm candles sold at the present time which contain 20 per cent. of paraffin, which is very unfair.

The CHAIRMAN said the committee would assume that proper candles were used, unless it were proved otherwise.

Cross-examined by Mr. CHITTY: While the company give 14-candle gas, the Birmingham burner shows the true amount of light; but, if they give more than 14 candles, the burner does not show it, and the company does not get the credit. On the other hand, if the company do not give 14 candles, the tendency of the burner would be to make it show still less, and therefore would exaggerate the difference. The burner I used was a burner of 48/100ths inch internal diameter, instead of 5/10ths of an inch; it did not correspond with the Birmingham burner; it was one more favourable to the gas. This burner having a disc to it, permitted a higher quality of gas to be burned. I could not have burned the gas at all, so as to have properly evolved its light, with the Birmingham burner. As a general question, if you test gas a mile and a half off, you lose something like 1 candle. But I have known instances where gas properly purified has not lost anything in illuminating power by travelling six miles. In this instance, there was no difference between the works and the office experiments; that was in consequence of the gas being well purified. There is a great difference of opinion as to whether it is possible, within a given time, to alter the quality of gas by consuming cannel coal. The difference of opinion amongst those best qualified to judge is so great that I cannot express any judgment upon it. The difference of opinion is not only as to the time required, but the effect of the change. I have never charged in my reports any company with falsifying experiments by that means—never.

Mr. *George Parker*, examined by Mr. MACKESON.

I am chief clerk of the Staffordshire Potteries station of the British Gas Company, Limited. I have held that office since 1861. I reside at the office, and have a photometer-room there. It has been fitted up since December, 1864. It has been my duty to make the photometrical experiments. I do it twice a day at the least—generally four times a day. There is no specified time, but all times, day and night, varied each day. I had that department especially, in conjunction with Mr. Haswell, for some time. I entered the readings in the photometrical book. I have the book here, beginning from the 6th of December, 1864. These returns were sent up to the head office once a month. I understand the testing of the illuminating power of the gas. This book contains a correct copy of the readings of my experiments. I have the original at the Potteries. Photometrical readings were taken at the works before that. I was not employed to do that. The manager, Mr. Haswell, did it. We have a complaint-book at the office, which I have brought with me. A copy of it is sent up to the head office monthly—it may be weekly. I do not generally send them. All complaints are entered in that book. It is the duty of the officer to enter them. There are no complaints in the book, except the ordinary ones, which relate to defective meters, burners, and fittings. There are none with regard to the quality of the gas or the price. There were no such complaints made to the company before this new company started. The complaints that were made were attended to immediately. I have compared the signatures of the petition of owners and occupiers against the bill with the rental-books of the company. I cannot tell the number of the petitioners in favour of the bill, nor the total annual gas-rental which they paid. I took the amounts out, but I have not got a copy here.

Cross-examined by Mr. CHITTY: My photometer was set up in September, 1864, and the entries in the photometrical book are since then. The complaint made by the Town Council was not made at the office, and was not therefore entered in the complaint-book.

Mr. *John Haswell*, examined by Mr. MACKESON.

I produce the photometrical book kept at the works. It has been kept from the year 1860. The illuminating power has been daily tested there, the same as at the office. That photometrical book contains the correct daily readings, except Sunday. The old Argand burner was used up to August, 1864; since then we have used the Birmingham burner. A copy of my readings was sent to the head office monthly. Officers came down from

London, from time to time, to see the testings made (the engineer always on his visits), and to compare them with the entries in the books.

Cross-examined by Mr. CHITTY: We have always used a little cannel coal in Hanley. We have not increased the quantity used lately.

THURSDAY, MAY 11.

The CHAIRMAN: The committee wish me to put to the British Gas Company whether they would undertake to bind themselves in some sufficient way to bring in a bill next year limiting their price to 3s. 6d. and their dividends to 10 per cent., fixing the quality of the gas at so many candles, and giving freedom to all persons and the corporation of Hanley to test the quality of the gas at any time they think fit.

Mr. O'MALLEY: We are prepared to give that undertaking and to enter into a deed binding ourselves to do it, under a penalty of £500.

The CHAIRMAN: What do the promoters say to that? You know we do not settle it at present—it is a matter for further arrangement; it is a mere suggestion, if it can be carried out to the satisfaction of all parties. What do you say? You have not considered it, of course?

Mr. LLOYD: The only case we know of in which that sort of thing was suggested there was also a condition that the costs incurred by the inhabitants in obtaining their rights should be paid.

The CHAIRMAN: The costs of the inhabitants—what do you mean? Do you mean the costs of coming here?

Mr. O'MALLEY: Your lordship will see the object of this.

Mr. LLOYD: You have no right to say that. I only stated that in another case in which this arrangement was made the costs of the promoters were allowed, on the ground that their opposition was justified.

The CHAIRMAN: I do not understand the force of the objection. Of course I understand the money question, but I do not understand anything more. Do you mean to imply that there is more in that observation than appears upon the face of it? They only ask for their costs to be paid.

Mr. O'MALLEY: I think if your lordships will look into the evidence on the first day you will see that there has been some hint thrown out about the costs. It is a sort of premium to persons to get up opposition gas companies.

The CHAIRMAN: It may be a great advantage that there should be such oppositions.

Mr. O'MALLEY: At all events, my lord, we can only say that the committee have very fully considered the whole case, and we are in the hands of the committee. Whatever they think is right and proper to be done this company are bound to submit to it. But I would ask the committe to consider the question of costs.

The CHAIRMAN: I think there must be a time fixed for the costs—at what period they should arise. Perhaps the best way would be for counsel and parties to retire and confer upon it.

Mr. O'MALLEY: If the committee were to adjourn the consideration of this case till to-morrow morning and go on with another bill——

The CHAIRMAN: I should think it would not take long.

Mr. O'MALLEY: The only thing is that it would be very satisfactory to me, standing in the responsible position I now do, to be able to communicate with two or three of the directors, none of whom are in the room now.

Mr. LLOYD: Would not an adjournment for an hour do?

The CHAIRMAN: Let there be an adjournment for two hours.

The parties accordingly retired. On their reappearing before the committee,

Mr. O'MALLEY said no arrangement had been come to between them. The British Gas Company were prepared to abide by the suggestions of the committee; but with respect to the payment of the costs of the promoters they could not agree, especially as it would be borne in mind that no allegations of misconduct of any kind had been substantiated against them, whereas, before the promoters came before the committee, they had offered the corporation to enter into an agreement of a very similar character with regard to the price and the quality of the gas. Nevertheless, they were prepared to do, in reference to the costs, whatever the committee might consider reasonable. The proposition they made was, that all the costs of promoting the bill should be paid by them, such costs to be determined by the arbitration of some indifferent persons, or by the taxing master of the House. They objected, however, to pay any of the expenses incurred in the formation of the company.

Mr. CHITTY said, in November last the promoters were willing to withdraw their bill if the British Company had consented to adopt their principles and pay their costs, which at that time were very trifling. But, instead of accepting that offer, they forced the promoters to persevere, and step by step as they advanced the British Company confessed their misconduct.

Mr. O'MALLEY denied that they had any misconduct to confess. On the contrary, he believed that no company had ever acted with greater integrity towards the public than they had done.

The CHAIRMAN said the committee were better judges on that point than the learned counsel for the company. He asked Mr. Chitty what, in his opinion, was the time from which the promoters were entitled to costs.

Mr. CHITTY thought they should be allowed them from the 29th of July, 1864, the date when the company was registered.

The CHAIRMAN said the £500 bond which Mr. O'Malley had spoken of was not a very heavy affair, and might not be worth anything with a great company like this.

Mr. O'MALLEY said the company were quite prepared to do whatever the committee wished. Of course, they could not be answerable for what might be done with such a bill as they were to undertake to introduce, nor what kind of opposition it might meet with, but they were prepared to enter into a contract that if they did not prosecute the bill the corporation of the town might prosecute it at their expense.

Mr. LLOYD intimated that a parliamentary pledge of that sort was better than a bond. He understood the arrangement to be this—the present bill to be withdrawn upon terms as follows:—First, the British Gaslight Company to undertake and pledge themselves to bring in a bill in the next session of Parliament, and so from session to session until successful, by which the maximum price of gas should be reduced to 3s. 6d. per 1000 cubic feet; the illuminating power fixed at 14 sperm candles, as tested by the Birmingham burner, and with clauses for the protection of the public, such as were contained in the Staffordshire Gas Act of last session. Those clauses related to the compulsory supply of gas to the public lamps if desired by the local authorities, with a provision for determining the price to be paid for such supply; testing the quality of the gas without notice; publication of accounts in the form prescribed by the Secretary of State in the case of the Metropolitan district; map of the mains to be deposited. These he believed were the principal features of the proposed arrangement. Another matter, which was one rather of suggestion than of condition, was that the company should be bound to supply fittings on hire at a rental of not more than 10 per cent. on the cost price. He did not think, however, that a difference on this point should stand in the way of a settlement. These were among the objects with which the Consumers bill was introduced, and he should like to see a pledge given for their attainment by the British Gas Company. One other object they sought—viz., that the management of the gas-works should be in the hands of persons locally interested in Hanley, they would by this arrangement fall in, but they had already offered the British Gas Company to retire if they would adopt their principles and price, and pay the costs incurred.

Mr. O'MALLEY said his learned friend had taken a most unprecedented course, and was treating the British Gas Company as though they were at his feet completely. He assumed to dictate terms which had never even been suggested by the noble lord.

The CHAIRMAN said he had intimated that there were other matters for arrangement besides those which he named, and he thought Mr. Lloyd was only acting in accordance with the suggestions he made.

Mr. O'MALLEY said he had never heard a word on the points which his learned friend had now spoken of as though they were matters already fully arranged. This was an attempt to define the model of the bill which the British Company were to bring forward from session to session until they succeeded in passing it. How could they possibly know what opposition they might have to encounter, or the parties that might come in and successfully establish their opposition? And yet it was proposed that they were to be saddled with the expense year after year of resisting the opposition possibly of parties in the locality, until they got a bill the model of which Mr. Lloyd had assumed to dictate. The British Gas Company were fully prepared to accept the substantial proposition of the committee to limit their price to 3s. 6d. maximum, to fix the illuminating power of the gas at 14 sperm candles, and give free access, at all times, to the consumers to test the quality of the gas without notice; but to accept the formula of the Acts of Parliament referred to, it would be monstrous to call upon them to do it. He would not undertake, as their counsel, to stand there and give such a pledge without further consideration.

Mr. LLOYD said he did not put it that the company should introduce precisely those clauses in form, but clauses which would secure to the public the same protection as these gave.

Mr. O'MALLEY said he did not know what protection those clauses gave, and therefore he could not undertake to do it without consideration. He accepted the proposition of the committee at once, and had thought that the only question to be settled was that of costs. And with respect to costs his learned friend was greatly mistaken. The truth was, that at some meeting of the Consumers Company convened, not by public advertisement, but by private circular, such a proposition was made, but it never was communicated to the British Company at that time. He would ask the committee to consider, if it had been done, with whom could his clients have made such an arrangement. But when they came before Parliament and gave such a pledge as they were now prepared to do, they would be able to refer to it as their protection in case of an opposition being got up against them hereafter. Had they made such a pledge to the promoters of this bill in November or December last, they might have had the same solicitors and engineers, getting up another company to invade their rights precisely in the same way as the promoters of this bill had done. There was no possibility of such an arrangement as the committee now suggested being any protection to them except it were made with the sanction of Parliament. And now his learned friend stated that it was their misconduct had brought them here. He (Mr. O'Malley) was prepared to submit to the committee that in going through the evidence it would be found that the promoters had not brought forward an instance of a single complaint being made against them from the passing of their Act, in 1858, until the memorial was got up on behalf of the new company. No one had ventured to allege that the British Company had taken more than they were entitled to, and he was prepared to show that they had never had so much. It might be the committee would come to the conclusion that the time had arrived when larger restrictions should be put upon the company than were imposed by the Act of 1858. He could quite understand the committee might feel that after the lapse of seven years it was time the maximum price was reduced to 4s., the illuminating power increased, and other security given to the public; but to say that that necessity was brought about, not by any defect in the legislation of 1858, but by the misconduct of the company, was to say that which he felt sure the committee would not endorse without such misconduct being proved. He thought the British Gas Company were going a great way when, for the sake of putting an end to further discussion, they accepted the suggestions made by the committee themselves, and agreed to pay the promoters the parliamentary costs they had incurred.

Mr. LLOYD said the proposition which he made was that British Gas Company should pay all the costs, charges, and expenses of the Consumers Company to the present time in the formation and management of that company, and in the promotion of their bill, or such a sum as an equivalent as might be settled by Mr. O'Malley and Mr. Rodwell, or some other member of the parliamentary bar; or, in case of dispute, by the noble lord in the chair.

After some further conversation, there appearing to be no chance of a settlement,

The CHAIRMAN recommended a further adjournment until the next day, and expressed a hope that in the interval the parties would come to an arrangement.

FRIDAY, MAY 12.

Mr. RODWELL said he had hoped that the parties had approximated to a settlement, but there still remained the question of costs. The dispute between them was as to the period from which the costs should be paid.

The CHAIRMAN said, as the parties had not agreed upon that point, the committee had determined that the costs of the promoters should be paid from the date of registration of their company.

Mr. RODWELL said they would be quite satisfied with that. The terms upon which the present bill would be withdrawn were, that the British Company pledged themselves to bring in a bill next session, by which their maximum price should be fixed at 3s. 6d., and the illuminating power of their gas fixed at 14 candles, tested by the Birmingham burner, and containing clauses giving the same protection to the public as were contained in the 13th to the 21st, the 24th to the 27th, the 34th, 35th, 36th, and 37th, to the 48th clauses inclusive (omitting the 47th) of the Birmingham Gas Bill of last session; that fittings should be supplied at a rental not exceeding 10 per cent. upon the actual cost price; and, further, that they would defray the costs and charges of the Consumers Company from the period of their registration to the present time, such costs to be settled by himself and Mr. O'Malley, or, in the event of their not being able to agree, to refer the same to the noble lord in the chair.

Mr. BURKE said he was no party to these negotiations, and in the absence of Mr. O'Malley he must assume that his learned friend, Mr. Rodwell, had correctly stated them; but there was one point upon which he wished to remark, and that was with regard to the fittings. The arrangement referred

to would give the company the monopoly of supply against all the gas-fitters in the town.

The CHAIRMAN said the committee would not go into this matter again; it had all been agreed to. The present bill would now either be withdrawn or the committee would reject it.

Mr. RODWELL said the promoters would withdraw it.

After some further conversation, the bill was withdrawn, and the proceedings terminated.

HOUSE OF COMMONS.

(Before Mr. TALBOT, *Chairman; Mr.* BRAMLEY MOORE, *Mr.* HUMBERSTONE *and Mr.* SCHNEIDER.)

BELFAST GAS BILL.

TUESDAY, MAY 2.

Mr. BURKE, Q.C., and Mr. MELLOR appeared for the promoters, and Mr. WILKINSON for the opponents.

Mr. BURKE said he had the honour to appear, with his friend, in support of this bill, which he hoped would occupy but little of the time of the committee. Its objects were extremely simple, and as yet he scarcely knew what the opposition was, although he had read the petition. That, however, the committee would learn as they proceeded. The main purport of the bill was to enable the gas company established at Belfast, and which has the exclusive right of supplying gas there, to raise capital sufficient to enable them to fulfil their obligations to the public. The old capital was expended, and now they were called upon to meet the advancing demand of the increasing town of Belfast. This they could not do without more money, and by this bill they asked power to raise additional capital to the extent of £94,000, and also to enable them to obtain a certain additional quantity of land whereon to erect additional works. The corporation of Belfast had taken the opportunity of the introduction of this bill to seek other conditions at their hands, most of which appeared to be unreasonable, as he thought he should be able to show to the committee. His shortest way would be to read the preamble, which recited that by the Belfast Gas Act, 1852, the share capital of the Belfast Gaslight Company was fixed at the sum of £106,000, and the company were authorized to borrow £18,666. He should observe that the Act of 1852 was not the first Act which the company had obtained, because they were incorporated as long ago as 1823, when Belfast was first lighted by the company. At that time the capital of the company was only £35,000. In 1823 gas was a novel introduction, and it was only with the progressive increase of the town, and the progressive knowledge on the part of the public of the use of gas, that the works of the company had gone on increasing their supply. So early as 1837 the company came to Parliament to increase their capital, and found it necessary to ask for £30,000, but they were then opposed by the local authorities of Belfast, who sought power themselves to light Belfast with gas. They, in 1846, obtained power themselves to supply gas to the town, raising the sum of £50,000; and he did not want to imitate the gentleman who had been addressing the committee so frequently by stating what became of the £50,000, but at all events it was not employed in the manufacture of gas, nor even in the erection of gas-works. It was not his province, he repeated, to say what the corporation had done with the money or to inquire in respect of it. They entered into a contract with his clients, in 1851, to supply the public lamps at an extremely moderate price—45s. per lamp. He did not know whether the committee was acquainted with the ordinary price of gas, but he knew enough to be aware that that was a very moderate charge indeed. The corporation had resisted the Belfast Company's application to Parliament for powers to increase their capital, in 1837; and they had been obliged to meet the demands of the public by appropriating the revenue to the construction of the works; and he found that up to 1852, although they commenced lighting Belfast in 1823, only three dividends had been paid, of £5 per cent. each; and whatever surplus they had they were obliged to lay out in the extension of the mains and works, in order to meet the increased demand. In 1852 they came to Parliament, and the capital was then fixed at £106,000, which included a sum of £21,000, which had been expended out of the profits as already explained; but, in point of fact, more than £36,000 had been spent. At that time, however, Parliament appeared to have allowed them to capitalize £21,000 only by declaring that the original £50 shares should henceforth be reckoned as £80 shares. In 1847, five years prior to 1852, an Act had passed, under the name of the Companies Clauses Consolidation Act. Honourable members were aware that with reference to railways and other undertakings, and amongst even gas undertakings, Parliament had taken under its consideration what should be a general law applicable to all, and passed several consolidation Acts, which were thereafter to be incorporated with every Statute which should be enacted relating to those undertakings; and Parliament took care, in the preparation of that Act, to introduce such clauses as they thought fair and reasonable to the companies and, at the same time, protection of the public interest. One of the principal of those clauses is "that no gas company shall hereafter pay more than 10 per cent. dividend on their capital;" and at the same time a provision was introduced that they should publish their accounts annually by sending them to the clerk of the peace, that they might be inspected by all parties; and if at any time it should appear, on the application of any gas ratepayer, that the profits of the company were in excess of 10 per cent., or that they were making, or capable of making, more than Parliament had limited them to, after laying by a reserve-fund, then, on application to the quarter sessions, the court had power to compel the company to reduce the price of gas. In the year 1847 the first Act was passed limiting the profits of these private companies. The clauses, therefore, of the Act of 1847 were for the first time incorporated in the Act relating to the Belfast Gas Company, and from thenceforward they were enabled to divide only 10 per cent. on their capital, no matter what profit they might make. They were also required by an Act of Parliament to supply the gas of defined illuminating power, and that illuminating power was what was termed 12 candles, which was a certain standard of measurement of gas, and photometrical measurement, for a particular burner should give the light of 12 candles. In 1860 the standard of illuminating power established in London, with reference to all metropolitan gas companies, was placed at 12 wax candles, by an Act of Parliament that was applied for by the City of London. Then, again, power was given to the corporation to test the illuminating power of the gas and also its purity. Again, the companies for the first time were required to supply gas compulsorily, and that was a very severe obligation on a company. Previously they had only been called on to supply where they themselves thought that the supply would be attended with profit; but being in possession of a monopoly of the supply of the town it was considered, as it was also in the case of the Metropolis Gas Act, that the company should come under the obligation to supply gas to all parties requiring it. In recent legislation care has been taken, however, of the interest of the gas companies to this extent, that where they are compelled to supply gas they shall not be compelled to do so unless the parties requiring it give adequate security for payment. He need not tell the committee that in many cases gas companies had to deal with a class of persons not very prompt in their payments and not very competent to pay often, and therefore it was considered to be hard on the companies to be compelled to supply those not in a condition to pay. But unfortunately, in 1852, the clause giving that security to the companies was omitted, and by this bill, therefore, they were seeking to remedy that defect. They were also required to limit the price of gas to 5s. per 1000 feet. That he should say was a very low price for Belfast, because the whole of the coal which is consumed for the purpose of gas-making is derived from England, and he found that in the majority of Acts of Parliament relating to gas companies in England there was a higher limit than that. So recently as 1860 the maximum price in London was 4s. 6d., where gas coal is more easily obtained. They were, however, far below that price actually in their charge to the public. Again, a power was given to them that they might sell or lease their works to the corporation. The corporation had always had a hankering after this, as many other corporations have had in England, and have always desired to get possesion of the monopoly, and his clients were quite willing, on fair and reasonable terms—but on fair and reasonable terms only—to assign to them their powers; therefore a clause was inserted in their bill giving power to sell or lease to the corporation, and to the corporation power to purchase. Having given that short history of affairs, the preamble goes on to state that "the company have raised and expended upon their undertaking nearly the whole of the share capital authorized to be raised, and they have borrowed and now owe £18,666, or thereabouts: And whereas the buildings and population within the limits of the Act of 1852 have of late years greatly increased, and are still increasing, and it is necessary that the capital of the company should be increased for the purpose of extending their supply of gas." That statement was so true that he believed there was hardly a town to which reference had been made which had gone on more rapidly increasing than the town of Belfast; and not only inceasing in ordinary residences, which do not consume an extraordinary amount of gas, but the linen trade has so largely increased there that it has resulted in the establishment of large manufactories consuming gas to a large amount. In corroboration of that statement, he found that their make of gas in the year 1851 amounted to 79,855,000 feet per annum, and in 1861 it was above 205,000,000. In 1851 they had 2780 consumers; in 1864 they had 9629. In 1851 there were 15,000 houses; in 1861 there were nearly 20,000. These figures would at once show how rapid had been the increase of buildings, and what must have been the increase of capital to enable them to go on meeting the growing demand. "By the Act of 1852 the company is empowered to purchase and hold lands for the purpose of their undertaking, not exceeding in the whole eight statute acres, and it is expedient that the company should have power to purchase and hold additional lands." That would show that these lands were essentially for the construction of works. "And whereas the sum of £56,000, part of the capital of the company raised by shares, is divided into 700 shares, of the nominal value of £80 each, and the remaining share capital of the company is divided into shares of £20 each, and it is expedient that the company should be authorized to divide each of their £80 shares into four shares, of the nominal value of £20 each: And whereas it is expedient to make provision for the holding of half-yearly meetings of the company, and for regulating the scale of voting: And whereas it is also expedient that the company should be authorized to convert, manufacture, sell, or dispose of the residual products arising from the manufacture of gas; and that they should be enabled to acquire by way of licence, and to hold and exercise patent rights in relation to the manufacture and distribution of gas and the utilization of the residual products arising from such manufacture or otherwise relating thereto." It has been found there have been sundry patents for utilizing the residual products of gas which can be best obtained on the premises of the company. "And whereas it is expedient that some of the powers and provisions of the Act of 1852 should be altered and amended, and that further powers should be conferred upon the company; but the objects aforesaid cannot be effected without the authority of Parliament." That was the preamble which they had to prove. Now they were petitioned against, and he must, of course, refer to the petition. He would only state that up to the present time they had never heard a complaint against the company. It was quite true that the company is an English company, not an Irish company, and that might have excited a little feeling on the part of the consumers at Belfast, but the supply had been managed so efficiently by local managers, appointed by the company, that they had never had a complaint of any description directed against them, and they were therefore rather astonished to find this petition presented. Of late years they had attained an amount of prosperity that they had not in former years. As he had pointed out, from 1823 to 1852 they had only three dividends of 5 per cent. Since then they had got up to their maximum dividend of 10 per cent. on their existing capital, and in the new capital which they sought they should limit the dividend to 7 per cent. He thought he might fairly appeal to any hon. Member who knew enough of trading associations to state whether that was not a very small dividend for any trading company, because trading companies are liable to very great risks. To his own knowledge one company in Wood Street had been mulcted in damages to the extent of £100,000 through the negligence of their servants, and they compromised it for £25,000 and costs. Such investments as these could not rank with Government securities, and such like, whereon the investor could get his 5 per cent. There was a trading company asking only 7 per cent., and taking all the chance of contingent losses. He should state that 7 per cent. seemed to be the limit which occurred to a noble lord who exercises his judgment in these matters, but it was in his (the speaker's) humble opinion far too low. The company were obliged to agree to the views of the noble lord, whose views were all powerful, especially on unopposed bills; and he had lately introduced a clause with reference to dividends on capital, but that was a very low dividend to take. However, the company did not want £94,000 to be spent within the year; but, taking all that he had stated into consideration, such a sum was necessary to obviate the necessity for perpetual recurrence to Parliament for an extension of borrowing powers. Now let them take the alternative. Suppose this company, instead of coming to Parliament for increase of capital to the extent he had stated, were to say that they could not go on supplying gas, that they had their 10 per cent. dividends, and their funds were all gone; another company starts up, and that company would be entitled to 10 per cent. In what condition would Belfast be? They would have two companies instead of one, and would have to pay on the capital a dividend of 10 per cent. instead of 7, whereas they had now an existing company which has given every satisfaction, who were now in Parliament for the purpose of increasing the supply, and taking out of the pockets of the public a dividend of 7 per cent. in the case of a manufactured article. Now they found that

although the maximum price in 1852 was 5s., in 1855 they reduced it to 4s. 7d., with a considerable discount to large consumers. In the year 1858 they reduced it to 4s. 2d., with a similar discount, and in the present year, they had further reduced it to 3s. 9d., with a considerable discount to large consumers, which made the charge to them 3s., and he stated unhesitatingly that such prices were unprecedented, that there was no such thing in England or Ireland, and they would not find another town in Ireland, and very very few—he did not know that there was any—in England. There was one in Liverpool, and the hon. member would correct him if he were wrong in stating that that was under very favourable circumstances. But he thought Liverpool was above the standard of 3s.; therefore, they saw that the Belfast Company had dealt liberally and fairly with the public—more liberally indeed that any other company under similar circumstances. He would now merely refer to the petition of the corporation. There were petitioners coming to London for the same purpose on almost all gas bills that he had had to dealt with, and they went away very often taking no great deal with them. He hoped the petitioners would do the same in this instance. The petition begins—"A bill is now pending in your honourable House, intituled 'A bill for granting further powers to the Belfast Gaslight Company.' That the public streets and thoroughfares of the said borough are under the jurisdiction of your petitioners, and that one of the duties of your petitioners is to provide for the proper and efficient lighting of such streets and thoroughfares." Here they had a statement that the public thoroughfares of the borough are under the jurisdiction of your petitioners. "That the said borough is now lighted by the Belfast Gaslight Company, who are the promoters of the said bill, under a contract with your petitioners; that the said company are the only company or body supplying gas at Belfast, and that your petitioners are not satisfied with the quality of the gas supplied by the said company." It was very strange that they should not have put this, for the first time, into a petition to Parliament, and not addressed a complaint to the company. He was told that there never had been a single complaint about the quality of the gas; and further, he should supply an omission of his, by stating that whereas by their original Act and the Act of 1852 the illuminating power of the gas was limited to 12 wax candles according to the standard, in the bill they had increased it to 14 sperm. Now, a sperm candle gives higher light than a wax candle, and they might judge, therefore, of the advantages to be gained by substituting 14 superior candles for 12 inferior—that is, 14 sperm for 12 wax—wherefore the public get an increased illuminating power without any increase of charge. Mr. Wilkinson told them that they were not going to quarrel about that. "The share capital of the company under their original Act (4 Geo. IV., c. 37) was £35,000; that the said company, after the passing of the said Act, and previously to the year 1852, had expended the sum of about £35,000 out of profits, in enlarging and improving their works; and that in the year 1852, by the Belfast Gas Act, 1852, the profits expended were capitalized," which was not true to the full extent of that sum; and "the company were authorized to raise a further sum of £52,000, and that the capital of the said company now is £106,000 in shares, with borrowing powers of £18,666." He (the learned counsel) stated the circumstances under which they capitalized that sum, but let them only look at the advantages which Belfast has enjoyed from 1823 to 1852—three dividends only having been made. The whole of the capital which had been spent out of profits was not subject to any dividend at all; the public had had the benefit for nothing, and yet they made it a ground of complaint in their petition—at least he supposed so, or they would not have put it in that they capitalized this sum of £30,000. This amount was not capitalized—it was but £21,000. "The company are, by their existing Act, limited to a maximum dividend of £10 per cent., and have hitherto paid a dividend of £10 per cent. on their capital." The word "hitherto" was subject to the explanation he had given, that for many years they paid nothing.

The CHAIRMAN: For how many years have they paid 10 per cent.?

Mr. BURKE said, nine years. "That since the year 1852 the said company have expended a considerable sum out of profits in enlarging their works and in the formation of a reserve-fund." That, so far as the formation of a reserve-fund, was true; but, so far as enlarging the works, his friend on the other side was misinformed. They had by the reserve-fund in strict accordance with the Act of Parliament, which said that, after dividing 10 per cent., they might lay by a certain sum as a reserve-fund to meet contingencies, and, in the event of the dividend ever falling below, to enable them to recoup themselves and make up the dividend to that amount. This being so, it could not be laid to their charge that they had acted in any degree unfairly to the public of Belfast. "That by the said bill it is proposed to enable the company to raise a further sum of £94,000 by the creation of new shares, which may be either ordinary or preferential, and if preferential, may be entitled to a dividend of £6 per cent. That your petitioners object to the large increase of capital sought to be authorized by the said bill, as injurious to their interests as the guardians of the public rights at Belfast, and as calculated to deprive the inhabitants of Belfast of the benefit to which they are entitled of a reduction of the price of gas, when the profits of the company have exceeded a sum sufficient to pay £10 per cent. on their authorized capital." Now, he had said distinctly what must indeed be obvious, that they did not want £94,000 in a year; but if he was in a position to show that the supply of gas had gone on increasing in so rapid a ratio that in a few years that £94,000 must be exhausted, that was all that could be necessary for him to show in order to prove that what they were asking was not in the slightest degree unreasonable, and he did not know really what his friends meant by stating that the period at which a reduction of the price of gas would take place would be hereby postponed. They should only lay out so much money first as was necessary to enable them to meet the increasing demand of the public, and upon that money they should receive only 7 per cent., and not 10. "That your petitioners are advised that there is no necessity for enabling the said company to raise so large an additional sum as £94,000, and that so much of the preamble of the said bill as relates to the raising of such additional capital is incapable of proof." He would take issue with them upon that. "That if it should appear to your honourable House to be expedient to enable the said company to raise any additional capital, the amount to be raised ought to be strictly limited to the requirements of the districts, and that the amount of profit to be received in respect of such additional capital ought to be limited to"—what did the committee think?—to "a rate not exceeding £5 per cent." Now, he put it to any reasonable man whether he thought that any sensible human beings, when they could get 5 per cent. guaranteed on railway debentures, East India stock, and securities of that kind, would go into a company of this kind, attended with all these risks, and invest their money at 5 per cent.? It was perfectly absurd, and the suggestion need only be mentioned to prove that it was utterly untenable. They must give something more than the ordinary rate of interest to entice people to embark in a trading speculation, and, as he had said, 7 per cent. was the limit conceded to any company by an Act passed during the last session. "That by an Act passed in the ninth year of her present Majesty's reign, intituled, 'An Act for the better Lighting and Improving the Borough of Belfast,' power was given to your petitioners to purchase or take on lease any gas-works and gas apparatus already erected and set up, or thereinafter to be erected and set up or used, for the purpose of supplying gas to the inhabitants of the borough or the vicinity thereof, and any lands and tenements, not exceeding 8 acres, held or enjoyed therewith." When it was said that power was given to the petitioners to purchase, the committee were not to understand that that was compulsory power—it was permissive power, providing the parties were willing to agree. "That by the Belfast Gas Act of 1852 powers were given to the said gas company with the consent of three-fourths in value of proprietors thereof present at any meeting of the company specially called for the purpose, to contract and agree to sell, dispose of or let on lease, grant or demise to your petitioners, all the houses, lands, plant, works, mains, pipes, stock, and property of the said company; and by the said Act the said company are empowered to purchase any quantity of land, by agreement with the owners thereof, or the persons entitled to sell the same, not exceeding in the whole, together with such other lands as may be then vested in them, 8 statute acres. That by clause 16 of the present bill it is proposed to empower the company to purchase by agreement and hold any additional quantity of land for the purposes of their undertaking, not exceeding in the whole, at any time, inclusive of the lands authorized to be purchased and held by the Act of 1852, 16 statute acres." It was quite true "that the effect of this clause, if it should pass into a law, would be to deprive your petitioners of the powers which they at present possess, and which, in your petitioners opinion, it is essential for the public interest they should possess, of becoming purchasers or lessees of the entire works and stock of the company." He was told the parties views on the other side were, that they had not the slightest objection to the powers remaining just the same as they are now—purely permissive powers, with reference to this new land as well as the old. "That if the said bill is permitted to pass into a law, it is essential for the protection of the public interest that further provisions should be made for securing the supply by the said company of good gas of a proper illuminating power, and for testing the quality of such gas." His friend had been kind enough to tell him that there was to be no discussion on that, and also as to the question of dividend and price—that was a question which ought to go to the referees, in accordance with the recent legislation of this House. They would find, if they looked at the Standing Orders, that all these questions relating to price, illuminating power, and so forth, are questions that now go before the referees; and if the parties did not choose to take their petition before the referees on these points, they could not be heard before the committee on the bill. And he found that in this petition, which was originally intended for the referees, the parties knew Parliament well, and the practice of the House, for he found endorsed on the petition, "the petitioners desire to be heard before the referees on the following points:—the quality of the gas and its price, the amount of first cost of production, mode of testing the purity and illuminating power of the gas." But they had not thought fit to go before the regularly established tribunal for hearing such objections, and therefore they could not embark in the inquiry before the committee; or else he did not know what use that other tribunal was, or why it was established. "That your petitioners further object to the provisions of the said bill with respect to the following matters—that is to say, clause 20, with respect to security for payment of rates." He had pointed out in an early part that it was an omission in their former Acts that they came under the obligation of compulsory supply, and it was only right that they should be adequately secured, so that the parties whom they were compelled to supply should pay what was fair and reasonable. Then, with respect to the recovery of sums due to the company, he asked for nothing but what was given in other Acts of Parliament. "That the said provisions are objectionable and unnecessary, and that the provisions of the Gas-Works Clauses Act, 1847, are sufficient for the protection of the said company, and ought not to be added to, altered, or varied for their benefit." Now, here was their petition, the great bulk, almost the whole of which relates to matters that ought to go before another tribunal, which Parliament has especially established, and that only. Into these matters, therefore, the committee could not go further. Then, with reference to powers over their property to purchase or sell, that he was quite willing to re-enact in this bill. The only point that appeared to be at issue was that the proposed capital was too large, and his friend stated that there was no necessity for taking so much money. That point he was perfectly willing to leave to the committee, and his friend would call the witness to prove that to their satisfaction; and he did not know what other opposition there could be to the bill.

Mr. *James Stelfox*, examined by Mr. MELLOR.

I am engineer and manager of the Belfast Gas-Works. I was appointed in 1852. The company was originally formed in 1823, with a capital of £35,000. In 1852 it had to come to Parliament for a bill. At that time rather more than £36,000 of profits available for dividends had been invested in the business; and the company had power, under their original Act, to borrow about £8000. In addition to that, the whole of the capital authorized by the Act had been raised and expended. By the Act of 1852 the share capital was raised to £106,000; and of the £36,000, £21,000 was capitalized. That was done by increasing the value of the shares from £50 to £80; while the residue of the £36,000 remained as money invested in the business, not bearing any interest. From 1852 up to 1864 the quantity of gas made by the company has steadily increased. In the year 1853, 96,069,000 cubic feet were made; whereas in the year 1864, 205,733,000 cubic feet were made. In 1851 the town required 935 lamps to be lighted, and those lamps were lighted by the company under a contract with the corporation. The price was 45s. annually per lamp, burning 3620 hours, at 4 feet an hour. The cost of lighting, cleaning, and managing the lamp was 15s. per lamp, and is so up to the present time. I think the complaints made about those lamps are very few indeed. The officers of the corporation have generally expressed themselves as satisfied with them. In 1864 the number of lamps to be lighted by the company, under that contract, was 1682. Up to the year 1864, £105,000 of the capital authorized had been raised; that capital was required owing to the extension of the town of Belfast, the increase of the population, and the number of consumers. The number of consumers of gas in 1851 was 2782; whereas in 1864 it was 9629. During those years the area of the town of Belfast had greatly enlarged, and a considerable additional number of manufactories been built. One factory made about two-thirds of their gas, and took a third from us. Last year the manager of that establishment called upon me, and agreed to take the whole of their supply from us. Our price was then 4s. 2d., with discounts down to 3s. 4d., the price with the highest discount off—20 per cent. The price is now from 3s. 9d. to 3s. net. The maximum price which the com-

pany have power to charge, under the Act of 1852, is 5s., reduced by discount to 4s. 6d. as the minimum.

The CHAIRMAN: On what terms do you allow the discount? Is it for prompt payment?

Witness: If the consumer pays within a month after the three months account is delivered he gets the discount.

By the COMMITTEE: We make an allowance to all who consume over 10,000 feet in a quarter. Up to that number the price is 3s. 9d.; then we take off 2½, 5, 10, 15, and 20 per cent.

Mr. MELLOR: What has been the increase in the consumption of gas for the last nine months over the corresponding nine months of the previous year?

Witness: 21·30 per cent. In order to provide for next winter it will be necessary that a considerable further outlay should be made in mains and in works. I think our present requirements will be at least £20,000 for the ensuing year and the commencement of the next. If Belfast goes on increasing at its present rate, and there is the same demand for gas, the amount of capital sought under the present bill will not, I think, last more than ten years. It will then be necessary to come to Parliament again. [The witness handed in a diagram of the increase of the consumption of gas from 1823 to 1864.]

A MEMBER: There is a decrease, I see, in 1857 and 1858.

Witness: There was a depression in the manufacturing departments at that time.

Mr. MELLOR: Where does the coal come from?

Witness: From Newcastle and from Wigan; all of it comes from England by railway to Maryport, and by ship from Maryport to Belfast. It is necessary to keep a large stock constantly on the premises. The quantity of coal from Newcastle and from Wigan is about the same; the cannel from Wigan is perhaps more. The whole of the available ground is now occupied by the company, and it is absolutely necessary they should obtain more. Eight acres will not be too much. The consumers of gas in Belfast are, I believe, generally satisfied.

Cross-examined by Mr. WILKINSON: You say you have been manager only since 1852?

Witness: Yes.

Mr. WILKINSON: Who preceded you?

Witness: Mr. Barlow.

Mr. WILKINSON: Not the accomplished engineer whom I see here?

Witness: No; Mr. William Barlow.

Mr. WILKINSON: Do you know anything of the antecedents of the company?

Witness: Not particularly. I know generally the history of its formation. I believe it was started in 1823. I cannot give you the name of the original promoter.

Mr. WILKINSON: Do you know that the capital was obtained from the Leicester Bank?

Witness: I do not.

Mr. WILKINSON: Do you know that the bank, in consequence of the bad management of the concern, were obliged to take possession of it themselves?

Mr. MELLOR: I must object to the question, on this ground. It is only usual, in these cases, to go into the transactions that have taken place since the last Act, and it is not competent to my learned friend to go into matters that took place under Acts that have been repealed. Mr. Burke merely stated the general history of the company for the information of the committee. I submit that the question my learned friend is putting does not bear on the point at issue.

The CHAIRMAN: He may ask any question he thinks proper in cross-examination. I presume he will connect the evidence in some way.

Mr. MELLOR: It is not the ordinary rule.

Mr. WILKINSON: The principle upon which I ask the question is, that this company, which is now seeking for an extension of its power, must prove to the satisfaction of the committee that its antecedents have been such as to entitle it to the confidence of those it seeks to supply.

The CHAIRMAN: How far back are you going?

Mr. WILKINSON: To 1823.

The CHAIRMAN: I do not think that would have much effect on the committee.

Mr. WILKINSON: But it would have this material effect, that inasmuch as one of the powers now sought is an increase of capital, if it be shown that the absence of dividend, of which a point was made by Mr. Burke, was occasioned by bad management and not by anything else, the necessity for fresh capital will fall to the ground.

The CHAIRMAN: If it is admitted that it has been well managed for a great many years, the original bad management would not much affect the committee.

Mr. WILKINSON: I am sure the committee will not think I am going into any detail of bad management.

A MEMBER: Had the Leicester Bank taken possession in 1852?

Mr. WILKINSON: Long before that.

Mr. MELLOR: In 1823. They did not exactly take possession; they supplied some money.

Mr. WILKINSON: I will not fatigue the committee by going into the matter further. (To witness:) Is it within your knowledge that the present company who now work this concern in fact received it from the bank, who handed it over to them?

Witness: I cannot say anything about that.

Mr. WILKINSON: I think my friend Mr. Burke told us that the company is composed entirely of strangers to the town of Belfast. Is it not?

Witness: Yes; I suppose so.

Mr. WILKINSON: Have you any doubt about it? Who are your masters, Belfast people, or not?

Witness: They are not.

Mr. WILKINSON: Is there a single Belfast man among them?

Witness: No.

Mr. WILKINSON: Where are the head offices of the company?

Witness: Our directors meet in Leicester. We have two offices at Belfast, one for the collection of moneys and rates, and another at the works for conducting the business. The annual meeting is not held at Belfast, but we have meetings of directors there. The reports do not contain statements of accounts. An annual statement is rendered to the clerk of the peace and the Secretary of State. No accounts are rendered to the shareholders, nor to the corporation. The agreement for lighting the town of Belfast has been 45s. per lamp ever since I have been there. I believe before that it was £3. 3s. 9d. for a short time. I believe there was previously an agreement for 21 years at £1. 11s. 6d., and immediately on the termination of that agreement the price was raised to the higher sum. It was just before the application to Parliament, in 1852, that it was reduced. The lowest price of gas is now 3s. 9d. without discount, and 3s. with the highest discount. A house of £14 a year would not consume the minimum quantity entitling to a discount. We have numbers of houses at Belfast that come upon the discount. I cannot say how many. There must be nearly 20,000 houses in Belfast. A house of £40 or £50 a year would consume the quantity—namely, 40,000 feet.

Mr. MELLOR said Mr Wilkinson should have gone into the question of the price before the referees, if he had intended to raise it.

The CHAIRMAN: I suppose the question is not asked to show that the price is too high.

Mr. MELLOR: I do not know the object. The highest price is 3s. 9d. Surely that is not too high.

Mr. WILKINSON: I should be quite content to have 3s. 9d. inserted in the bill as the maximum, instead of 5s. But I will not go further into the question of price, for my friend is quite right in saying that I ought not to go into it here, not having gone into it before the referees.

Witness: The coals from Wigan are sea-borne; the present price of Wigan cannel is 21s.; Newcastle and Wigan ordinary coal is worth 14s. or 15s. in Belfast. We use from 17½ to 20 per cent. of cannel. The coals are carted from the ships to the works, which are about a mile from the quays. There is no railway carting. I have no doubt the price of our gas to ordinary consumers may have been 10s. per 1000 for many years, but I do not remember. The highest price I remember being charged in my time was 5s. We have gone as far as our maximum. There are a great many mills at Belfast. The number in proportion to the private houses is almost unparalleled in Ireland. The discount applies principally to the mills and large works. We should require an outlay of £20,000 on mains and alteration of works. The limits of supply are to remain the same as at present. If the town increases as it does at present, we shall require the £94,000 we ask for and more. The proposed increase of mains and works refers to this year and next. There is a great portion of the municipal borough still unlighted, for the lighting of which we have applications daily. Houses are being built in all directions.

Mr. WILKINSON: Is it not within your knowledge that the people resident in the rural locality have objected strongly to the lighting of it, and will not consent to pay the rates necessary?

Witness: I do not know anything about the rates. I have no knowledge of it. There are two or three private lamps at Windsor, I think, but no public lamp. No extension is wanted there at present.

Mr. WILKINSON: Is it within your knowledge that last year at Belfast has been somewhat an exceptional year, in consequence of the American war, which has caused a good deal of prosperity to the town?

Witness: No doubt.

Mr. WILKINSON: You cannot rely upon that as a permanent circumstance to increase the prosperity of the town?

Witness: I cannot say as to that.

Mr. WILKINSON: Upon the subject of complaints, you said they were small. Have you not had complaints more than once?

Witness: We have had no complaints of any moment. They have been referable to meters or fittings, or things of that sort. I do not call those complaints as to quality or supply. I have been consulted about this bill. We expected 10 per cent. in the first instance for the additional capital. You will see in the amended bill that is now 7 per cent. if the money is raised as ordinary capital, and 6 per cent. if by preference shares. We had last year, after paying our dividend, about £3700 surplus.

Mr. WILKINSON asked the witness to procure a copy of the last accounts, but he said he had no authority to do so.

Mr. SCHNEIDER considered that nothing could be learned from them. They would be a mere statement of receipts and expenditure, and would not further the learned counsel's object.

The CHAIRMAN said that unless they could be tested they would not affect his mind; an accountant could make them show anything.

Mr. MELLOR, however, searched for a copy, and handed it to Mr. Wilkinson.

Mr. WILKINSON: Supposing the account shows that there is an expenditure of £10,000 or £12,000 on the new works, it would show that £20,000 or £24,000 was an excessive estimate.

A MEMBER: Do your clients dispute the necessity for these additional works?

Mr. WILKINSON: I do not think we should object to a moderate addition to supply a fair increasing population, but we do object to £94,000 as a great excess. We say that £24,000, the sum suggested by this witness, is much nearer the mark, and if the company had applied to increase their capital only to that amount, we should not have been here. We are interested in this way: we have power to purchase these works, and it might be as well that the corporation of Belfast should represent the consumers instead of a party of strangers; but I object to the £94,000 as interposing a very material difficulty in purchasing the works.

Mr. SCHNEIDER: You are assuming things that do not exist. I may be taking a wrong view of the case, but it seems to me that you have no power whatever to purchase. You have an Act of Parliament which says you may purchase, but it does not give you the power to do so. You have another party who may say, "You shall not purchase unless you pay us so much money." They have power to state their own terms. You have permissive powers—not compulsory.

Mr. WILKINSON: As you are aware, permissive powers are very often construed in Acts of Parliament as compulsory.

The CHAIRMAN: In some Acts of Parliament.

Mr. SCHNEIDER: But the present Act says, "Provided that three-fourths of the shareholders at the meeting assembled shall determine that they do sell to the corporation." Three-fourths of the shareholders may positively refuse, and you cannot bind them to sell; and you must give them such a price as they choose to ask.

Mr. WILKINSON: That would be always regulated by the amount of capital. We should have to go to the Court of Equity, and we should have the power to compel a sale on equitable terms.

Mr. SCHNEIDER: I cannot go to that. It must be with the consent of three-fourths of the shareholders. Besides, you cannot suppose that any company would go and spend money, and limit themselves in their bill to 7 and 6 per cent. just for the pleasure of spending money.

Mr. WILKINSON: But that 7 per cent is evaded in all possible forms and ways. There are such things as bonuses and all that.

Mr. MELLOR: There is nothing of that sort here.

Mr. WILKINSON: No; you are virtuous to the last degree, no doubt, but we must treat you, for the purpose of the present argument, as if you would be rogues if you could.

Mr. MELLOR: You should not make the statement unless you can show that something of the kind has taken place.

Mr. WILKINSON: We may say, as far as the Legislature is concerned, there

does not appear an ostensible reason for an unnecessary outlay, but it may be that their outlay is unnecessarily extravagant for the purpose of increasing the price to be paid by us when we purchase, as we probably shall.

Mr. MELLOR: If it will shorten the inquiry, I may inform the committee that I have here two eminent engineers, Messrs. Hawksley and Barlow, who would satisfy the committee, I think, directly that this outlay is necessary.

By the COMMITTEE: I consider £70,000, in addition to the £24,000, a fair sum.

By Mr. WILKINSON: For the last 40 years we have spent only £105,000. No doubt the mains will be carried further as they are required.

WEDNESDAY, MAY 3.

Mr. WILKINSON said that the bill, as amended, to a certain extent met some of the points of his opposition. The material points on which his opposition now rested were as to the additional capital to be raised, which they considered to be excessive; and they also required the production by the company, to the corporation, of their accounts for inspection. He believed these two points would put in order the issue to which their opposition was at present narrowed.

Mr. MUNDELL: Does my friend mean that the corporation are to have access to our accounts?

Mr. WILKINSON: Yes; you furnish an abstract now to the clerk of the peace.

The CHAIRMAN: The company already lodge a statement of their accounts with the clerk of the peace. What objection can there be to furnish the corporation with them?

Mr. MUNDELL: The corporation have only an interest as possible purchasers. Why should they have more than the general law gives them? Any two persons can go, by means of an order from the recorder or a judge, and examine the accounts themselves, and report on them. The general law has given them that power. I object very strongly on principle that we should be bound to furnish anything. If there was any complaint made that we were not supplying the lamps at the lowest possible price, there would be something fair in the application; but we are supplying them at the lowest price, and, in fact, a great deal below what might be expected. The objection to it is this—once let in the thin edge of the wedge to a litigious corporation, they would then say, give us a little more; whereas, if we stop them *in limine*, we preserve ourselves in a safe position. But they would say to the next committee, who would not know how you had dealt with it, let us have a right to your entire accounts, of which we have been in the habit of having an abstract.

The CHAIRMAN: Is it an uncommon power for a corporation?

Mr. MUNDELL: It is quite an uncommon power, particularly where a company conducts itself with perfect propriety.

Mr. WILKINSON: My learned friend's objection seems to be based on the apprehension of litigation. He assumes these motives (and I protest against it) for our wanting these accounts. Surely we, as a corporation, are the proper parties to protect the interests of the private consumers of that borough, and the interests of the corporation with regard to the public lamps.

The CHAIRMAN: The committee are unanimous that the corporation ought to have a copy of the accounts as furnished to the clerk of the peace.

Mr. WILKINSON said it appeared to him that a mere abstract, such as was furnished to the clerk of the peace, would not be of much value. In the Birmingham, and other bills which might be named, a special clause was inserted, compelling the company to furnish a more extended account.

The CHAIRMAN said that had better be argued in support of their clause.

Mr. *James Stelfox* recalled, and further cross-examined by Mr. WILKINSON.

The item of £20,000, which I referred to yesterday, only had reference to additional apparatus needed now, and had no reference to future works; it has no reference to an additional gasholder, but simply works needed for the coming winter. He had no detailed estimate for the future works, but he considered they would want in the next four years at least £40,000 to £45,000. That would be sufficient for about four years requirements. They would have to put down a new main. The present one was a 12-inch, and they would want to put down a new main, 24 inches, in the street he mentioned yesterday, and that was part of the works in respect of which they were going to spend £20,000. What they wanted this extension of works was for the present area of consumers. They proposed to take eight acres of land more, and, in his judgment, it was a necessary area for the increased consumption of gas. The cost, at a rough guess, of purchasing this land was between £700 and £800 an acre. The new gasholder, of which he had spoken, with the tank, &c., would cost about £15,000. He had made a tabular statement of the increase in the consumption of gas since they obtained their Act in 1852. The average quantity for the three years, 1853, 1854, and 1855, was 103,592,666 cubic feet. The average for the next three years, 121,287,666 cubic feet. This showed an increase of annual supply, on an average of the last three years, taken in contrast with the preceding three years, of 17,695,000 cubic feet. The average in 1859, 1860, and 1861, was 156,221,000, being an increase of 34,933,334, in contrast with the three preceding years. In the last period of three years ending June, 1864, their average was 191,890,666, being an increase of 35,669,666 on the three previous years.

Mr. MUNDELL: That shows that the American war does not at all form an exceptional period in Belfast with respect to the consumption of gas. There must necessarily be an increase of gas arising from the increased number of houses, and the growing necessities for it of those to whom it was supplied, but they could not exactly determine to which it was most to be attributed. They had always made it a point of not making new works out of revenue. They had a balance in 1864 of £3700. It was carried forward to next year, and when their accounts were made out, and they found that they had a balance, they advertised immediately a reduction in the price of gas. The consumer got the benefit immediately. He handed in yesterday a copy of the abstracts which they furnished to the clerk of the peace, and he believed that it was much fuller than the Act of Parliament required, and contained many more details. The 38th section of the Gas-Works Clauses Act, 1847, directs that an account in abstract be prepared of the detailed "rents and funds" under the several distinct heads. They gave far better and fuller particulars, and this had been done voluntarily on their part. They went into the question of repairs, buildings, mains, services, trade charges, &c. A reduction of 5d. per 1000 feet would absorb that £3700. They had just made a 5d. reduction, and had, in fact, absorbed that £3700.

By Mr. BRAMLEY MOORE: They commenced to pay 10 per cent. about 1855. Their early dividends were three of 5 per cent. They expended £35,000 in works, and capitalized £21,000 in 1852. They had carried over a reserved fund of £9800. The first account showing a reserved fund was in 1858, which was £7000. In 1859 they added £1750 more, and with interest and some additions it stood as it now appeared. The area which their powers allowed them to go over was beyond the boundaries of the municipal borough. They took Holywood, which was four miles, and Shankhill, and in other directions they went about two miles beyond the limits of the borough. They did not go far into those districts, but supplied them at the same price. He did not think, when they went to a certain area outside the limits, that it was to the interest of the company to lay out money apparently at a loss, to secure a greater per centage.

Mr. BRAMLEY MOORE: I will explain myself. Your pipes cost probably £1000 a mile. If you supply the gas within the limits of the borough, you can do so at a lower price than you can two miles beyond. Then if you are charging a price that leaves you a profit over and above 10 per cent., it is clearly the interest of the company to make unprofitable works.

Witness: I do not see the point.

Mr. BRAMLEY MOORE: Suppose you have got a surplus of £9800, and you do not know what to do with it, you must reduce your rates; it is then to the interest of the company to extend their mains to the district you have mentioned, and if they pay you only 4 or 5 per cent. to go there, you are allowed by law to divide 10 per cent., therefore you are interested in laying out capital there at a loss, is it not so?

Witness: It might be done, but I do not believe it applies in our case.

Mr. BRAMLEY MOORE: But is it not desirable that some protection be afforded to prevent your doing so, because it is notorious that it is done in many towns? (To the chairman:) The reason of my putting this, sir, is that it has been the case that in some towns they have extended their works four or five miles into the country, and supplied the gas in the country to the same extent as in the town, and they are getting 10 per cent. for it. (To witness:) What are your shares sold at.

Witness: The £80 shares are sold at £160, and the £20 shares at 38½.

Mr. BRAMLEY MOORE: With regard to increase of buildings, is it left to your discretion what money you lay out in buildings? If there is no check upon you, is it not the interest of the company always to do these things extravagantly.

Witness: No, I am not aware that it is.

Mr. BRAMLEY MOORE: But is it not to the interest of the company, because you get 10 per cent.?

Witness: That might be done, but I believe we have studiously avoided it in our case.

Mr. BRAMLEY MOORE: Is there any check upon that?

Witness: Of course the new works are all submitted to the directors, and nothing is done without their sanction; but they can regulate and order anything.

Mr. MUNDELL: The future capital to be laid out by this company will be 6 per cent. on the preference capital, and 7 per cent. on the ordinary stock.

Mr. BRAMLEY MOORE: That is the principal point, but if they are allowed to increase their capital, they may soon make their 7 per cent 10. If the 7 per cent. is *bonâ fide* restricted to that, it is to the interest of the public and the consumer.

Mr. MUNDELL: Our bill says we can only get 7, and probably it may be 6.

Thomas Hawksley, Esq., examined by Mr. MUNDELL.

He had visited Belfast with a view to examining these works and seeing their condition, with respect to the proposed extension of capital. The works, as at present erected, with the exception of retorts, were only just adequate to the existing demand; there were 48 retorts in excess of what were required at the present time. With respect to the works for the purification of the gas, and other apparatus, they were inadequate to the wants of the town, and the consequence was that the company were now taking means to improve these departments, and were, in fact, pulling down portions of the works where the new apparatus was intended to be placed. The present producing power of the works per day was 1,650,000, but there was always some burnt-out retorts, dead retorts, and the real capability of the retorts and other apparatus was 1,500,000 per *diem*. The actual manufacture last winter had reached 1,364,000, so that the margin was very small that they would be capable of producing. Looking at that and at the increase of Belfast in size, he was of opinion that there should be immediate additions. He had great experience on that point, and had found in manufacturing towns very generally, and in other towns as well, that the works and the manufacture doubled themselves in eight or nine years. That had been the case at Nottingham for the last 24 years, and the works now and the consumption of gas was eight times as great as it was 24 years ago. The works had doubled at Liverpool in about nine years, and the works at Glasgow had increased fivefold since 1842. These were all instances perfectly consistent with what had taken place at Belfast. He found that in ten years there had been something more than a duplication of the consumption, and had it not happened that there were two years in which, owing to peculiarities in trade, the increase was for the moment arrested, there would have been a duplication in eight years. He had no doubt that the consumption would continue to increase in future years in about the same ratio. If that were the case, the capital proposed to be raised under the powers of this bill would not last more than 12 years at the longest, and it may be exhausted in 10 years. The question, therefore, was whether the company should be brought back to Parliament earlier than that period. There were always large expenses every time Parliament was resorted to, and there were more conflicts and great mischief done. He should say that to continue the supply to Belfast an immediate outlay of £25,000 would be required. A new main of 24 inches instead of 12 would be wanted without doubt. The pressure to give the delivery at present required was 45/10ths; no gas company could conduct its business if the pressure were more than 20/10ths; but the mains were so small and the consumption so great that the friction had increased to such an extent as to require a pressure of 45/10ths to drive the gas into the town—being just more than double what it ought to be.

Mr. BRAMLEY MOORE: That makes the gas oscillate, does it not?

Witness: Yes, it increases the leakage and produces a very different pressure at one end of the town compared with the other. Near the works the pressure is 4½ inches, and at the further end of Belfast it is only one inch.

Mr. SCHNEIDER: Does it not increase condensation?

Witness: No.

By Mr. MUNDELL: Those increased mains, &c., would require £20,000 to £25,000. What was required would be additional retorts, condensers, engines for working the exhausters, exhausters themselves, purifiers, buildings for retorts, &c., and mains into the town. That would be about £25,000. A new gasometer will be required, and the cost of that would be more than £15,000, as nearly as possible. The actual cost was within a fraction of 6d. per cubic foot. Nothing could be more prejudicial to gas-works than enlarging their works piecemeal—a little now and then, as they became inadequate to meet the demand. It was like a grown boy's coat, they must throw it off altogether when it was too small and give him a new one. They might go on with their purifiers, &c., as long as

possible, but then there came a time when they could not have more, and they must take out the whole lot and put in new ones. Experience taught them that they could not manufacture unless they had about an acre for every quarter of a million feet. That was to say, they required storeage for coke, coals, and manufacturing apparatus; and, as he apprehended there would be within the period spoken of nearly 3 million feet of gas consumed in the 24 hours, that would be 7½ acres.

Mr. SCHNEIDER: I think you said a quarter of a million for every acre, which is 12 millions.

Witness: Yes. I made a mistake, by dividing instead of multiplying. Then there was a remote gasholder as well. He did not think that they could avoid coming to Parliament for 12 years. They would have, indeed, to come to Parliament some little time before their means were exhausted. He apprehended the whole of this capital would be used up within the 12 years, and that the company would be obliged to resort to Parliament sooner. His experience was that it was difficult to induce a company to expend its money in laying mains to suburban villages which ought really to be lighted. He did not think there was any inducement in the case of this company to waste capital for the purpose of enhancing dividend. His experience was quite to the contrary. He could not say as to whether or not, if the company were to borrow the capital by way of preference, the people in Ireland would be willing to lend it at 6 per cent.; but he should think that, as preference stock took precedence of the dividend, that plenty of people would be willing to advance it at 6 per cent., because that was a dividend-paying company, and the shareholders would always have the profits to look forward to. There was always an objection to raising money on preference shares as long as it could be raised on ordinary capital, because there were very few old shareholders who liked to have other parties taking precedence of them in the division of the profits. They preferred, if they could, to rank equal. With reference to whether they would go into a district and spend money uselessly, in the Nottingham bill they were before the committee 13 days, and that subject was very much discussed. I believe the committee looked at it in the light that the people within the limits and outside were all one community, and that they could not separate the interests of the people in the town from the interests of those occupying mills and factories within a few miles of it; and they thought it reasonable that a boundary-line ought not to be drawn, to divide the people in and out of the town in a social point of view. There was a differential rate in the case of Nottingham beyond certain rather wide limits, and the corporation thought to increase that differential rate upon a third area; but Parliament resolved that it should not be so. In this case, the promoters did not seek any increase in their area of supply; it remained as it was before.

Cross-examined by Mr. WILKINSON: Witness did not know the extent the company were authorized to supply. He knew Belfast tolerably well, and had known it for some years, and had been over the out-districts round the town. He saw very few suburban places, villages to be lighted. There were a few public works, but those had been lighted. If other manufacturing works grew up in the district, no doubt it would be necessary to extend the mains to those works and to the population that would be gathered around them. The district as exhibited on the plan he produced [producing a plan] gave a very fair view of the extent to which the gas had been carried. [Witness described on the map.] He was at Belfast a fortnight ago, and on that occasion it was for the purposes of this inquiry. He did not represent to the committee that that map gave the exact limit of supply, it was merely a sheet of the Ordnance map, and they had marked upon it the distance the gas went. He was not aware that Holywood was nearly eight miles from Belfast, but it might be so. He was not aware that Holywood had a gas company of its own. There was no parliamentary company at Holywood, or he should have known its name.

Mr. MUNDELL objected to this question, as there was no such clause in the bill.

The CHAIRMAN said the only question was as to the desirability of increasing the capital, and to what amount. No doubt it must be increased; that was perfectly clear; but £94,000 was thought too much.

Witness said he was not able to say there was a company existing at Holywood, and supplying gas to that district; but he thought he should certainly know it if it was a parliamentary company. He was aware, in respect to advancing money to this company, that the shareholders were English. He knew the project for lighting Belfast with gas emanated from Leicester. The shares were all taken up in Leicester, consequently the management had been there. He never knew that they refused to let the Belfast people take shares in the company. Taking into consideration the peculiar construction of the company, he did not think that there would be any difficulty in raising the money at 6 or 7 per cent.; that was to say, not on ordinary stock, but if a large sum were raised on preference stock, it would take precedence of the ordinary stock. If I had to advise them, it would be to raise ordinary stock at 7, and not preferential stock at 6 per cent. He had never known a company increase their works for the purpose of increasing their capital. His observations applied directly to all cases of gas companies and water companies within his experience; but there were undertakings, no doubt, in which that operation would be pursued with advantage to the shareholders. With respect to investing money unnecessarily for the sake of a large per centage, that which operated on their minds was that shareholders generally, especially in gas and water companies, were a timid race, and were always reluctant to make investments, and required rather to be impelled, either by an absolute public want, or some pressure brought to bear upon them from without. That was the general result of his experience. It generally happened that in a few years the shares of gas companies got largely into the hands of trustees under wills or marriage settlements, and other bonds, and trustees were always very reluctant to make an additional advance. There were only 48 retorts more than were wanted. The present power of manufacturing gas was 1½ million cubic feet per day, or nearly so. Perhaps there was room in the retort-house for 48 additional retorts; the number actually on the premises was 306, and of these above 250 were used last year. That would give them a surplus of one-fifth over the existing supply, but they must always allow 10 per cent. off the number for casualties, and that would, of course, reduce the number, and would leave about 25 available. He allowed 365 working days, Sundays, of course, included. It was not because the consumption had duplicated itself in 10 years that he looked for its doing so again, but because his experience of other places led him to that conclusion. He knew of duplications in nine years.

Mr. MUNDELL was about to call Mr. Barlow, when

The CHAIRMAN said perhaps it might save an unnecessary protraction of the inquiry if he informed the parties that the committee were unanimously of opinion that the sum asked for was not at all too much.

Mr. MUNDELL: Then I should only be wasting time if I called any other witness.

Mr. WILKINSON said the material point of his contention was that this was an excessive amount, because they would bear in mind that the company was a company of strangers, who had supplied the town of Belfast for a number of years, and at a very large profit from this manufacture of gas. They would also remember that the provisions of the Act gave them power to purchase the works, which provision was confirmed by the bill under their notice. He found that the promoters had conceded that. But the interest which the corporation of Belfast had in limiting, so far as possible, the amount of increased capital was, no doubt, twofold. First, that additional difficulty might not be thrown in the way of their effecting the purchase, which, in the interest of the town of Belfast, it was to be hoped they shortly would; and that, in the next place, the company might not be tempted to lay out unnecessary capital for the purpose of getting a remunerative dividend upon it. It was very difficult for him to hope to represent to the committee, as he must say candidly it had struck his own mind, that sufficient proof had not been given of the necessity of this outlay. For immediate use £25,000 increase was required. The consumption might increase so as to require additional capital, but he was at a loss to apprehend the ground on which the committee thought the outlay of £74,000 was justifiable. They would remember that in the evidence of Mr. Hawksley he told them that the existing power of manufacture was 1½ million cubic feet per day. Now the present supply was nearly 200 millions, and there remained a surplus under the present capital to supply the increased amount for the next 10 years, proceeding upon the basis of the last 10 years increase to 200 millions, and the present power of supply extended to 500 millions.

Mr. SCHNEIDER: Mr. Hawksley stated distinctly his greatest power was 1½ million per day, and that they had used 1,364,000; and therefore the total power they had now was not 10 per cent. They had not enough now; it was a most dangerous thing. He spoke from practical experience. To get a consumption of 200 millions they must have the power of making 500 millions, or they would not be able to supply the gas required on the 1st of January. Therefore the limit was the limit of the longest night.

Mr. WILKINSON said he should leave the matter in the hands of the committee, without any further observations.

The CHAIRMAN then declared the preamble of the bill proved.

Mr. WILKINSON then proposed the insertion of the following special clause (42) and schedule, which was inserted in the Birmingham and Stafford Bill last year:—"In lieu of the account prescribed by the 38th section of the Gas-Works Clauses Act, 1847, an account in the form and containing the particulars specified in the schedule to this Act shall be made up to the 30th day of June each year, and shall be published for two successive weeks in some newspaper published and circulating in the borough of Belfast, in the month of October following; and a copy of the said account shall, in the same month, be transmitted free of charge to the town-clerk of the borough of Belfast, and to the clerk of the peace of the same borough, under a penalty of £20 for each default; and the copies so sent shall be kept by the said town-clerk and clerk of the peace respectively, and shall be open to inspection by all persons at all reasonable hours, on payment of a shilling for each inspection; but no other fee of any kind shall be chargeable in respect of the said account." [The schedule was a mere form for a detailed account of profit and loss, and a proper balance-sheet.]

Mr. MUNDELL said he objected to it very much. He understood his friend proposed that they should be put under a penalty unless they furnished an account to the corporation, and he challenged him to show that such a thing had ever been imposed upon any company that had not been guilty of some misfeasance. What he understood the committee to say was that they were to furnish to the corporation the same abstract as they did to the clerk of the peace. In the Birmingham case, and in the case of the metropolitan bills, in which it originated, all these companies had been guilty of all sorts of tricks to delude the consumer, and to get a much larger profit than they were entitled to under the Act of Parliament, and there was not a single iniquity that was not imputed to them; and therefore Parliament said that they should be placed under a better restriction, by furnishing accounts to proper persons, as a check upon these defaulting customers. The Birmingham Bill was the case of a defaulting company, and so were the metropolitan companies. But if they had not been reducing their gas *toties quoties* as often as they could, there might have been some reason for the insertion of that clause in the bill. The Act of Parliament under the general law required that they should give an abstract of the total receipts and expenditure, of all rents and funds levied under the powers of the Act; and it was really very important that the object of that clause should be seen. It was not a question as to what were the contents of the 42nd clause, but what the general law required them to do. His learned friend asked for a clause inflicting a penalty against a company that had made no default. And moreover, they had not only furnished abstracts showing the general heads required by the Act, but they had been in the habit of doing considerably more than that. Under a penalty of £20, his learned friend asked them to furnish a complete detailed account. He considered it was a most inquisitorial clause and schedule, and he wished to know on what principle it was that they asked for its insertion against them. He submitted that the proper clause would be this:—"That a copy of the abstract account required by the 38th section of the Gas-Works Act, 1847, be furnished to the town-clerk of Belfast." That was all they ought to do; and he trusted that the committee would not subject them to the inquisition of the corporation of Belfast more than was required under the general law.

Mr. HUMBERSTONE: We will consider the clause.

Mr. MUNDELL said the object was to see what their rate of profits was. If the rate was much they got their 10 per cent., or 6 per cent., on the preferential capital, as the case may be; and the higher their rate of interest the sooner they would get an accumulated fund to the prescribed amount, which under the Gas Clauses Act is to form a reserved fund for contingencies; and when we arrive at that there is to be a reduction in the price of the gas for the benefit of the consumers. Then they appointed an auditor to look into the accounts, and see that no improper charge was made, so that the result might be a reduction in the price of gas. He should like to know whether, with these two safeguards, they should be entitled to ask for this increased power. In London there were 12 or 13 companies who were to be allotted in districts, and this clause was instituted in order that the Secretary of State might have some means of supervision with respect to their accounts. But here they were a company without spot or blemish, and his friend had not attempted to show that they have been guilty of any delinquency, and yet he said treat this company like companies who have been guilty of misfeasance, and he ventured to hope that the committee would reject the application. He moved, therefore, as an amendment, by way of substitution for his friend's clause, the clause which he had read to the committee.

The CHAIRMAN said the committee would weigh the exceptional clause

inserted in the Act of last year, because that took the bill out of the provisions of the Act.

Mr. WILKINSON said his friend had intimated that they had been guilty of defalcations. He protested against that. He believed the reason was because the abstract of accounts furnished under the Act of 1847 was, in the case of the Birmingham and London companies, really insufficient to give the information which it was desirable parties like the corporation should have, and, therefore, this special provision was introduced into that Act.

The CHAIRMAN wished to know why the London and Birmingham companies should be taken out of the powers of the General Act.

Mr. MUNDELL said the very same application was made in the Nottingham bill, and it was refused by the committee. He was in the bill, and, therefore, he spoke from experience.

Mr. WILKINSON: That was a case for supplying an outlying district. But surely if there ever was a case admitting of being taken out of the ordinary legislation, he trusted the committee would think this was peculiarly one in which the protection of such a clause was more necessary than that of delinquency proved against a company. In the first place, prevention was better than cure, but they had this peculiar state of things—a town in the North of Ireland supplied with gas by a body of gentlemen living in the West of England, a most peculiar case, and one which required means for examining and overhauling the accounts by parties not locally interested in the place, but in the largest possible degree interested in the protection of their capital. Again, over and above the necessity of supervision there came this further strong claim, that the corporation were probable purchasers. They were a corporation to whom a special power was reserved by this bill to purchase the works of the company. That justified them in asking the same protection for the town of Belfast as was given to Birmingham. The fact had been made apparent to them that their £80 shares were worth £160, and their £20 shares worth £88, that the whole thing had been a highly lucrative concern, and that the additional capital they now sought power to raise would also itself bear a very high rate of interest, in whatever way it might be raised. He did think, bearing in mind the peculiar character of this company, and the absence of anything like local inducement to supply local wants, and a motive for spending money in a manner which if the accounts were investigated they would not dare to do, and seeing that if they became purchasers of the works the accounts would be properly kept, he ventured to hope that the committee would think those were circumstances of so peculiar a nature as to outweigh the motive for granting the special motive in the Birmingham bill.

The room was then cleared.

On counsel and parties being called in,

The CHAIRMAN said the committee had determined that clause 42 of the Birmingham Act of 1864, together with the schedule, be added to the bill.

Miscellaneous News.

EQUITABLE GAS COMPANY.

The Half-Yearly Meeting of Proprietors was held at the Office, John Street, Adelphi, on Tuesday, May 2—J. HOLDSHIP, Esq., in the chair.

Mr. ANDREWS (the secretary) read the advertisement and notice convening the meeting. The minutes of the last meeting were also read and approved.

The following report and statements of account were then presented :—

The increased consumption of the company's gas during the last half year has exceeded any corresponding period, and rendered it necessary to provide additional manufacturing power to meet the demand for the ensuing winter; your directors have therefore determined to make arrangements for carrying out the required new works. They consist of retort-beds, retorts, and the usual apparatus connected therewith; purifiers, scrubber and condensers, exhauster, steam-engine and boiler, and various alterations resulting from such additions to your manufacturing plant. The whole of the works are in progress, and it is anticipated they will be completed before the winter, at an estimated cost of about £10,000, which will be provided for by a final call of £4 per share on the new shares in November next.

The area of the company's works did not admit of a choice of space on which to erect the new retort-beds, but to appropriate what had hitherto been a valuable store for about 1500 tons of coal; but inasmuch as the consumption of coal keeps pace with the demand for gas, it is indispensable that we should keep up the storage capacity, and your directors have to report the purchase, at a reasonable rate, of some houses adjoining the south-western part of the works, with the view of adapting them to that purpose.

In the last report it was intimated that a reduction of 6d. per 1000 cubic feet in the price of your gas would be made on the 1st of July next; and your directors have now the satisfaction to report their intention of carrying this into effect, and that notice has been given to the customers in the usual way.

At this meeting two directors and one auditor will go out of office in conformity with the company's Act of Incorporation. The directors who retire are James Birch Kelly and Charles Henry Anslie Martelli, Esqs., and John Stroud, Esq., auditor, and, being eligible, they offer themselves for re-election.

Annexed are the profit and loss account and balance-sheet for the half year ended the 31st of December last; the former shows a net profit of £19,711. 12s. 5d., which, with the unappropriated amount of the previous half year of £429. 10s. 3d., makes £20,141. 2s. 8d. available for distribution, from which your directors recommend a dividend of £2. 10s. per share on the old shares, of 18s. 1d. per share on the new shares, and a further dividend of £1. 12s. 6d. per share on the old shares on account of the arrears now due. The several dividends will be less the income-tax, which will be deducted accordingly.

Dr. *Manufactory and Revenue Account, for the Half Year ended December* 31, 1864. *Cr.*

To Tradesmen's accounts, purification, &c.	£ 293	11	10	By Gas-rates, to Dec. 31, 1864	£37,570	17	5
Coals, carbonized	14,973	1	10	Meter-rental	783	12	0
Wages (manufacture only)	3,688	2	3	Coke, net sales and stock	5,770	19	10
Rent, rates, and taxes	577	3	10	Breeze, ditto	286	6	9
Directors fees	650	0	0	Tar, ditto	1,164	8	1
Auditors ditto	45	0	0	Ammoniacal liquor	350	8	9
Salaries	1,568	15	0	Balance of interest account	73	14	3
Collector's commission	337	9	11				
Stationery and stamps	109	2	8				
General charges	300	15	1				
Bad debts and allowances	60	8	0				
Wear and tear	3,632	11	10				
General law charges	20	3	4				
Income and property tax	32	9	1				
Net profit, to Dec. 31, 1864	19,711	12	5				
	£46,000	7	1		£46,000	7	1

Dr. *Balance-Sheet.* *Cr.*

To Capital, joint stock—				By Investment, to June 30, 1864	£260,602	19	7
Old shares, £50	£200,000	0	0	Less mains taken up	84	18	1
New ditto, £25	84,000	0	0		£260,518	1	6
Dividends	185	9	2	Charged this half year	159	12	4
Tradesmen's accounts, &c.	3,156	4	0				£260,677 13 10
Taxes, rates, &c.	151	14	1	Meters			6,452 6 6
Collector's commission	169	3	6	London and Westminster Bank			5,025 6 8
Auditors	45	0	0	Cash balance			1,717 4 6
Income and property tax	501	6	3	Gas-rates			23,485 0 4
Profit and loss	20,141	2	8	Tradesmen's accounts for coke, &c.			3,498 10 7
Debentures	800	0	0	Coals—stock			3,584 4 1
Debenture interest	5	5	2	Coke—ditto			60 0 0
				Tar—ditto			101 11 3
				Ammoniacal liquor—ditto			23 12 6
				Service-pipes—ditto			223 10 7
				Main-pipes, &c.—ditto			720 18 5
				General stores—ditto			1,726 1 4
				Lease of offices			1,359 4 3
				Resheeting gasholders			500 0 0
	£309,155	4	10				£309,155 4 10
Unappropriated profits to June 30, 1864	£ 429	10	3				
Net profit to Dec. 31, 1864	19,711	12	5				
Amount available for dividend	£20,141	2	8				

The CHAIRMAN: Gentlemen, the directors having on this occasion sent you, for the first time, a copy of the report and accounts in a particular form, which I hope you will approve, you have had the opportunity of becoming familiar with all that has taken place during the past half year, so that it will not be necessary for me to detain you with any lengthened observations in moving—"That the report of the board of directors and the accounts, as certified by the auditors, be received and entered upon the minutes." I would just make one remark upon the first part of the report. At the last meeting it was stated that in all probability there would be no necessity for further outlay upon the works for some time to come. The experience of the last winter's campaign, however, has proved to us that some outlay must be made. Our consumption of gas has been much larger than we anticipated, and we have no doubt that the reduction of price will lead to a still further demand upon the power of our works. We have, therefore, felt it to be desirable at once to take the matter in hand, and commence operations. I have no doubt, as I said on the last occasion, you will very cheerfully respond to any call we may make for the purpose of defraying the expenditure. We propose to make a call in November next of £4 per share. That will exhaust our powers in reference to the raising of capital. Something is said in the report about the purchase of land, but, perhaps, I had better not enter into the details of that, as the matter is not yet completed. With respect to the reduction of the price of gas, we have sent out a notice of our intention, which has been well received by the consumers. Our operations generally are satisfactorily conducted; we have no complaints, and we hope still to retain our high position in the estimation of the public. While we continue to meet the wants of the whole of our consumers, we ourselves derive the benefit of the works being well conducted. I may say that there is no fear of your not receiving all that you are entitled to in the shape of arrears of dividend. We have already lost, £22,100 of those dividends; that we cannot possibly recover, but from this time we confidently expect that you will receive all that belongs to you in this respect. Beyond that we have the power to raise a certain sum as a reserve-fund, and that we expect to raise gradually; after that is done, of course, the public will be entitled still further to participate in the success of our operations. I need hardly say that from time to time, as opportunity occurs, we shall most willingly make further reductions in the price. Such reductions cannot, of course, take place at present, but according to the success of the company so will be the additional advantage to the consumers. We go hand in hand with them, and while we obtain for ourselves all the Legislature has declared us entitled to, it is our duty as well as our pleasure to see that they reap corresponding benefit. With these remarks I beg to move the adoption of the report and accounts.

Mr. RHODES seconded the motion.

A PROPRIETOR inquired the amount of the reserve-fund which the company were entitled to create.

The CHAIRMAN: £20,000.

The PROPRIETOR remarked that when the proposed call in November was

paid, the capital of the company would stand at £300,000, and he thought they were entitled to a reserve-fund of 10 per cent. upon that, or £30,000.

The CHAIRMAN said the company were limited to £20,000, as the amount of their reserve-fund.

Mr. HADLAND said under the General Act, the reserve-fund might be augmented to 10 per cent. upon the paid-up capital; but, of course, if the company were limited by their special Act to £20,000, it over-rode the general provision in this respect.

Mr. RHODES said he had visited the works that morning, and was much pleased with the excellent order in which everything appeared.

The CHAIRMAN, in answer to several inquiries by the last speaker, said the £4 call would enable the directors to pay for the property intended to be purchased, and also for the alterations and improvements now going on upon the works. With the exception of £800 (to be paid off this month), the debenture debt had been extinguished.

Mr. RHODES said he hoped the directors would not overlook the claims of the officers of the company to participate to some extent in the continued prosperity of the company.

Mr. LIDDLE said he could fully confirm the truth of the observations made by Mr. Rhodes as to the efficient state of the company's works. He ventured to express a hope that, looking to the prosperous condition of the Metropolitan Gas Company, the attention of the directors would be specially directed to the improvement of the quality of the gas supplied to the public. He believed that gas as consumed generally in private sitting-rooms and bedrooms, which were usually unprovided with proper ventilation, was injurious to health, and the injury was in proportion to the quality of the gas consumed, supposing the same quantity to be in each case burnt. As the districts of each company could not be extended, the only way of obtaining an increased rental would be by supplying gas of superior quality, so that each consumer might be induced to use it more freely. If a gas which gave out a great heat, and of comparatively a low illuminating power, was supplied to the customers the consumption of gas would fall off; therefore it was the interest of gas companies to turn their attention to improved modes of manufacture of gas. The only rivalry between gas companies should be in the direction of supplying the public with pure gas at the lowest possible cost to them, so that the public might participate as largely as possible in the prosperity of the companies. He was convinced that the able engineer of the Equitable Company was fully up to the advancement which had been achieved in the science of gas-making, and would give his attention to the improvement of the quality of the gas supplied, and endeavour to remove from it all deleterious compounds. He believed he was correct in saying that the gas supplied by this company was considerably above the parliamentary standard of illuminating power.

Mr. MICHAEL was afraid that some misapprehension would arise in reference to the remarks just made. He felt sure that Mr. Liddle would not wish it to go forth as his opinion that the burning of gas in private dwellings was injurious to health.

Mr. LIDDLE said he thought he had so qualified his remarks as to prevent misapprehension.

Mr. MICHAEL felt that the qualification was not so full as it should be. The public, unfortunately, were always too ready to grasp at statements which prejudicially affected gas companies, and therefore it was important that such remarks as had just been made should not go forth uncontradicted. He believed that, independently of its being the best and most economical means of heating and lighting a room, gas was the most valuable agent for the purpose of securing ventilation. If persons were to shut up a room which was lighted with as many candles as would be required to produce the light of a gas-burner consuming 5 cubic feet of gas an hour, they would find that the deleterious effects would be much more serious, for the simple reason that more of the oxygen of the air would be consumed, and a larger proportion of carbonic acid and carbonic oxide thrown off. The mistake sometimes made was this—persons who had been in the habit of burning a couple of candles, which gave but little light, and of course only a trifling amount of heat, became consumers of gas, and got a light equal to, perhaps, 16 or 20 candles, and immediately they began to express astonishment that their room was so much warmer than it had been before. It was palpable that such must be the result, but it was erroneous to suppose that, therefore, the consumption of gas was deleterious if properly burned. It was like other good things, only by the abuse of it that the public got a wrong impression as to the employment of gas. There could be no question that it was at once the best and most economical of lights, and the most efficient warming and ventilating agent under efficient management.

Mr. LIDDLE said he intended only to state an opinion that gas in an impure state was injurious, and not at all to reflect upon the quality of the gas supplied by the Equitable Company, which he believed was of a very superior quality.

Mr. AGER said he did not think that that was sufficiently explained at first, and therefore he was glad to hear the observations which Mr. Michael had made.

Sir JAMES DUKE said he had no doubt Mr. Liddle intended to make an exception in favour of the Equitable Gas Company.

Mr. LIDDLE said he did, for he knew that Dr. Aldis, who was a friend of his, spoke in the highest terms of this company's gas, as being the best in London.

The CHAIRMAN said the company had it upon the testimony of the scientific gentleman who tested their gas that it was always above the standard of illuminating power, and was in all other respects of satisfactory quality. He could truly say that the object of the directors was to supply the best gas they could possibly give, and that it should be always equal to, or above, the requirements of the Legislature. They had kept this point steadily in view, and would continue to do so. He might remark, in reference to the accounts of the company, that the proprietors would observe the sum charged under the item of "bad debts" was extremely low, being about the sixth of a pound per cent., which he was sure they would all regard as very favourable. With regard to a remark which fell from Mr. Rhodes, he was very happy to bear his testimony to the great care and vigilance of the company's officers, for he believed it was to this cause, and the general good management, that the smallness of the bad debts was attributable. The directors were always desirous to recognize the services of their officers, and to reward them as opportunity occurred. He felt sure the officers themselves were perfectly satisfied with the conduct of the board towards them.

The motion was then put, and carried unanimously.

The CHAIRMAN then moved—"That a dividend be now declared out of the profits of the concern for the half year ending the 31st December last of £2. 10s. per share upon the old shares, and of 18s. 1d. upon the new shares, and that a further dividend be declared of 32s. 6d. per share upon the old shares, on account of arrears now due, and that the same be payable, less income-tax, after the termination of this meeting, and on the 3rd, 4th, and 5th inst., and afterwards on every Tuesday and Friday between the hours of ten and four."

Mr. RHODES seconded the motion, which was carried unanimously.

The retiring directors, Messrs. Kelly and Martelli, were re-elected, and each of these gentlemen briefly returned thanks on his appointment. The retiring auditor, Mr. Stroud, was also re-elected.

Mr. HADLAND proposed a vote of thanks to the chairman and directors, for their able management of the affairs of the company, and expressed his sense of the great services which had been rendered by the board for many years past—services which had been attended with the most gratifying results in the continued and increasing prosperity of the undertaking.

Mr. LIDDLE said he had much pleasure in seconding the resolution, because it afforded him the opportunity of saying that he not only felt the proprietors owed a debt of obligation to the directors for their able management, but also for the uniform courtesy with which they always met the proprietors. He hoped the remarks he had previously made would not be misunderstood, because he had the greatest confidence in the engineer of the company, who he was aware was fully alive to all the improvements of the day, and was at the present moment instituting experiments whereby he hoped to be able to remove from the gas the bisulphide of carbon. If his observations were likely to create a wrong impression, he was extremely glad that Mr. Michael had taken them up in the way he had done.

The motion was very cordially adopted.

The CHAIRMAN said the directors were always glad to receive the assurance of the confidence of the proprietors, and they were much obliged by the vote just passed. They would continue to devote themselves, as they had always done, to the promotion of the interests of the proprietors, and hoped that the same success would attend them in the future as had attended them in the past.

The proceedings terminated with a vote of thanks to the auditors.

Legal Intelligence.

COURT OF EXCHEQUER.

THURSDAY, APRIL 27.

(*Sittings in Banco, before the Lord Chief Baron* POLLOCK *and Baron* PIGOTT.)

HEMSTEAD *v.* THE PHŒNIX GASLIGHT AND COKE COMPANY.

HEMSTEAD AND WIFE *v.* SAME.

The first was an action brought by the plaintiff for injury done to his house by an explosion of gas, caused by some pipes of the defendants, which were alleged to be improperly, unskilfully, and negligently put up; by which explosion and injury the plaintiff was prevented carrying on his business. He also claimed damages for loss of profits and injury to furniture. The second action was for injury done to the wife of the plaintiff by the explosion of the gas; and the plaintiff claimed damages for her incapacity from business, and the loss of her comfort and services, expenses of nursing, and for medical attendance.

The plaintiff brought the two above-mentioned actions, the first on the 27th of March last, and the second on the 12th of April last, against the gas company, for injury and damage done to his house, and also to his wife, by an explosion of gas from the gas-pipes constructed by the defendants. The plaintiff was possessed of a house at Greenwich, in which he carried on his trade of a grocer and cheesemonger. The declaration in the first above-mentioned actions complained that the defendants so negligently and unskilfully managed certain gas-pipes and the gas therein, and the said pipes were so insufficiently and improperly constructed, that large quantities of gas escaped and exploded in the plaintiff's house, whereby such house was injured and rendered unfit to be used as a dwelling-house or place of business, and the plaintiff lost the use and enjoyment thereof, and was prevented from carrying on his trade, and lost large gains and profits, and certain plant, tools, wearing apparel, stock in trade, fixtures, goods, and furniture of the plaintiff, then being in and near to the said house, were injured and destroyed.

To this action the defendants pleaded—first, not possessed; second, not guilty; and thereupon issue was joined.

The declaration in the second above-mentioned action complained of the defendants in a similar manner for their negligent and unskilful management of the gas-pipes and the gas therein, and the insufficient and improper construction of the pipes; that the gas escaped and exploded, whereby and in consequence thereof his wife was knocked down, rendered insensible, and grievously hurt, bruised, and wounded, became sick, sore, ill, and disordered, and was permanently disabled and incapacitated from following her usual business, for which he claimed damages, and also damages for the loss of the comfort and services of his wife, as well as for the expenses incurred for nursing her, and for medical attendance. The defendants had not yet pleaded to the second action, but on the 24th inst. applied for a consolidation of the two actions, when Baron Pigott, made an order "that these actions be consolidated, the costs to be costs in the cause."

Mr. LYELL now moved to rescind that order, and contended that the Common Law Procedure Act, 1852, sect. 40, did not apply in the present instance; he referred to that section and to the notes thereon in Day's Common Law Procedure Acts (last edition). In the first action issue had been joined, in the second the defendants have not yet pleaded.

Lord Chief Baron POLLOCK, in delivering judgment, said: We think the language of the Act of Parliament in the section referred to is plain, and by that we must be guided. The order for the consolidation of these actions is correct, and therefore there will be no rule; to prevent any delay or inconvenience in consequence of the present state of the pleadings, an application to rectify that can be made at chambers upon summons.

Baron PIGOTT: When the summons was before me to consolidate the actions, I should have put the defendants under proper terms as to pleading, &c., if asked.

Rule refused.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF APRIL, 1865:—

Maximum light estimated by sperm candles according to the Act	15
Minimum light—sperm candles	12·6
Average light—sperm candles	13·8
Traces of ammonia, indicated by turmeric test-paper	Constantly.
Traces of sulphuretted hydrogen, indicated by lead test-paper	None.

During the month of April the illuminating power of the gas varied, at the times of my testing, from 12·6 to 15 sperm standard candles; the mean of all my results was 13·8. Ammonia was constantly indicated by test-paper, but there was no evidence given of sulphuretted hydrogen.

CHARTERED GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of this Company was held at the Offices, Horseferry Road, Westminster, on Friday last—the governor, SIMON ADAMS BECK, Esq., in the chair.

The SECRETARY (John Orwell Phillips, Esq.) read the minutes of the last half-yearly meeting; and the report of the directors, having been already circulated among the proprietors, was taken as read.

The directors have the pleasure to place before the shareholders the accounts of the company for the half year to Christmas last.

In redemption of their promise, and, as it is believed, in the prosecution of a judicious policy, the directors have given notice that, from Christmas next, they will reduce the price of gas in their districts, and it is not unnatural to anticipate that this step may possibly entail some reduction in the dividend payable to the shareholders as from that date; but it is hoped that a liberal treatment of the public, and a rigorous economy of management, coupled with the largely increased consumption which may be expected, and the extensions and improvements which have been and are still being made in the company's works to meet it, may render any falling off of profits of a temporary character only.

The large new gasholder erected on the company's land at Millbank has now been in action for a period of six months with entire success; and the directors have therefore commenced the construction of another, of almost equal magnitude, and on precisely similar principles, to complete the payment for which, however, a call upon the shareholders will become requisite. With these additions to their plant they will be prepared to meet all the demands which are likely to be made upon them in the present year; but they foresee the necessity of an early application to Parliament for largely extended powers, to enable them to provide adequately for the increased consumption of gas which a reduction in its price is certain to create.

The annexed accounts show the position of the company to be one of still-continued and steady improvement; and the profits realized during the half year permit the directors to declare a dividend at the rate of 10 per cent. per annum on the present paid-up capital, after providing for which a surplus of profit will remain equal to 2½ per cent. per annum on the amount of capital called up at Christmas, 1858. The directors, therefore, acting in pursuance of the provisions of the Metropolis Gas Act, recommend that this surplus be also divided amongst the shareholders, in augmentation of the dividend declared to that date; both dividends being (in the usual manner) transmitted to the shareholders by post on the 15th day of May next.

In conclusion, the present satisfactory position of the company affords to the directors a favourable opportunity to bring to the notice of the shareholders the zeal with which the officers of the company watch its interests, and the ability with which they discharge their several duties. They have therefore felt that, in presenting them with a gratuity of 5 per cent. upon their respective salaries, they have but anticipated the wishes of the proprietary at large.

The directors who, pursuant to the company's Acts, retire from office, are F. A. Winsor, Esq., and Captain J. C. Giffard. Both gentlemen are eligible, and will offer themselves for re-election at a special court of proprietors to be holden for the purpose on Friday, the 26th day of May next, at twelve o'clock precisely.

Profit and Loss Account, from June 24, 1864, to December 25, 1864.

Dr.			*Cr.*		
To Coals consumed in the half year, including labour		£58,880 8 8	By Rental of light for the half year		£129,014 4 9
Stores, &c., used in the half year, viz.:—			Coke, breeze, deducting labour, viz.:—		
Retorts and setting, including labour		3,804 6 7	Coke	£19,932 19 8	
Lamps and lamp lighting, ditto		2,197 0 9	Breeze	1,057 15 3	
General wear and tear, and mains	£11,032 5 2				20,990 14 11
Less received for old and burnt stores	1,255 1 8		Tar and other products, deducting labour		4,065 2 7
		9,777 3 6	Discounts and abatements allowed by tradesmen for cash payments		1,185 6 6
Carrying on the works		3,650 2 11	Poplar station rent account, balance		12 3 9
Meters and fixing, including labour		3,465 14 4	Rents received		408 14 9
Paving		1,037 11 2	Interest received on deposits at bankers		1,063 9 10
Directors and auditors		1,255 16 0			
Salaries and commissions		5,080 16 6			
Wages and contingencies, viz.:—					
Wages	£14,662 5 2				
Contingencies	1,359 9 5				
		16,021 14 7			
Rent and taxes, viz.:—					
Rent	£1,030 1 8				
Taxes	2,934 6 9				
		3,964 8 5			
Income-tax		685 2 9			
Law expenses		37 4 8			
Annuities to superannuated officers		399 9 3			
Sick and benevolent fund		130 0 0			
Debts due, being bad, written off	£955 6 0				
Received on bad debts	47 2 4				
		908 3 8			
Amount of a collector's default, less amount recovered, and received from Guarantee Society		2,501 9 4			
Depreciation of gasholder and coal-store on leasehold property		60 0 0			
		£113,856 13 1			
Balance		42,883 4 0			
		£156,739 17 1			£156,739 17 1

Balance-Sheet, December 25, 1864.

Dr.			*Cr.*		
To 1st, 2nd, and 3rd capitals		£600,000 0 0	By Amount due to the company, viz.:—		
Fourth capital		180,000 0 0	For rent of light at the several stations, viz.:—		
Expended, viz.:—		£780,000 0 0	Westminster station	£53,108 4 1	
Westminster station—			Brick Lane ditto	23,791 1 7	
Balance at Midsummer	£440,923 16 3		Curtain Road ditto	12,565 17 4	
Expended this half year, viz.:—					£89,465 3 0
For purchase of freehold and leasehold property	£ 45 17 6		For coke and breeze sold at the stations, viz.:—		
New works	13,625 19 2		Westminster station	£2,257 7 11	
Ditto mains	3,229 1 5		Brick Lane ditto	2,102 3 0	
	16,900 18 1		Curtain Road ditto	182 4 5	
Brick Lane station—		£457,824 14 4			4,541 15 4
Balance at Midsummer	£173,013 12 7		For tar and other products sold at the stations		15 13 10
Expended this half year, viz.:—			Balances of sundry accounts due to the company		1,643 9 8
For new mains	950 16 1		Treasurer's accounts, viz.:—		
		173,964 8 8	Balance of general account	£12,511 19 6	
Curtain Road station—			Ditto of dividend ditto	580 18 5	
Balance at Midsummer	£86,531 11 0				13,092 17 11
Expended this half year, viz.:—			Cash advanced to pay wages at the stations		1,180 0 0
For purchase of freehold and leasehold property	£1,443 12 2		Stores on hand, viz.:—		
Less amount received for old building materials	11 0 0		Westminster station	£2,136 5 5	
	1,432 12 2		Brick Lane ditto	2,368 4 6	
		87,964 3 2			4,504 9 11
		719,753 6 2	Coals on hand, viz.:—		
		£60,246 13 10	Westminster station	£5,045 18 3	
Dividends remaining unpaid		6,487 14 4	Brick Lane ditto	4,300 14 8	
Debts due by the company for coals, and to sundry tradesmen and others		14,685 4 1	Curtain Road ditto	995 3 3	
Amount due to collectors for commission, viz.:—			On shipboard	4,999 19 2	
Westminster station	£ 499 18 11				15,341 15 4
Brick Lane ditto	217 13 2		Coke and breeze on hand, viz.:—		
Curtain Road ditto	102 14 4		Westminster station	£392 9 5	
		820 6 5	Brick Lane ditto	151 18 2	
Amount due for wages and contingencies, viz.:—			Curtain Road ditto	37 9 6	
Westminster station	£1,073 7 10				581 17 1
Brick Lane ditto	631 16 5		Tar and other products on hand		453 5 5
Curtain Road ditto	200 8 2		Ship *Dispatch*		869 12 9
		1,905 12 5	Depreciation-fund, for gasholder and coal-store on leasehold property, invested in the purchase of £715. 5s. 3d. Reduced Three per Cent. Annuities		653 4 1
Amount due at chief office for contingencies		17 16 8	Contingent-fund, invested in the purchase of £19,541. 11s. 11d. Reduced Three per Cent. Annuities		18,415 12 2
Balance of profit and loss, viz.:—					
Balance to June 24, 1864	£43,690 13 10				
Less half year's dividend on £720,000	39,360 0 0				
	£4,330 13 10				
Profit of the half year ending Dec. 25, 1864	42,883 4 0				
		47,273 17 10			
Depreciation-fund, for gasholder and coal-store on leasehold property, at Midsummer	£ 583 17 9				
Add proportion for this half year	60 0 0				
Ditto dividend received on amount invested	9 6 4				
		653 4 1			
Contingent-fund at Midsummer	£18,382 10 11				
Add dividend received on amount invested	285 15 11				
		18,668 6 10			
		£150,758 16 6			£150,758 16 6

The CHAIRMAN said his only duty now was to bring before the proprietors the comparative statement between the half years ending Christmas, 1863, and Christmas, 1864. At Christmas, 1863, they had carbonized 65,445 tons of coal, at a cost £54,167, being at the rate of 16s. 6½d. per ton. At Christmas, 1864, they had carbonized 70,650 tons, at a cost of £58,880, at 16s. 8d. per ton, being an increase in coals and quantity of nearly 8 per cent., and of money 8¾ per cent. The gas made at Christmas, 1863, was 619,297,000 feet, and at Christmas, 1864, 653,694,000 feet, being an increase in gas made of 5½ per cent. The gas per ton of coals at Christmas, 1863, was 9462 cubic feet, and at Christmas, 1864, 9252 cubic feet, showing a decrease of gas per ton of coals of 2¼ per cent. That decrease arose, in a great measure, from the statement made by Dr. Letheby, the medical officer of the City, relative to the undue quantity of sulphur in the coals. The doctor was of opinion, apparently, that the London gas companies did not understand their business so well as he did, asserting that the increased heat was productive of a larger amount of sulphur. In order, however, that there might not be the slightest pretence for this complaint, they reduced the making of the gas by lowering the heats; but instead of finding any improvement by this step, it turned out that there was just as much sulphur with the reduced heats as when they had the greater heats, so that Dr. Letheby took nothing by his motion there. But to leave nothing undone that could fairly test the matter, they employed Mr. Barlow, and another celebrated engineer in conjunction with the City and Central Companies, at a cost of £500, to make experiments. They were occupied for months making the most elaborate experiments, the result of which was that they could not tell them of any method by which the sulphur could be got rid of. Some coals had it in a large proportion, and the following week the very same coals would not have it at all; and it was, therefore, impossible to find a remedy for it, and he was happy to say that, as a consequence of these experiments, Dr. Letheby's reports for the last three months had been most favourable, so far as the question of sulphur was concerned. At Christmas, 1863, the rental of light was £121,242, and at Christmas, 1864, it was £129.014, being an increase in rental of 6½ per cent. At Christmas, 1863, the products amounted to £20,337, and at Christmas, 1864, to £25,056, being an increase of 23¼ per cent. This was a very large and very satisfactory increase. From the increased price of coal there had been a very large demand for coke and breeze, and it had been a very fortunate result for the gas companies. At Christmas, 1863, the rental for coals was 37s. 0¾d., and at Christmas, 1864, it was 36s. 6½d., being a decrease per ton of 1½ per cent., which would arise from the same cause as the reduction in the make of gas. At Christmas, 1863, the net cost of coal per ton deducting products was 10s. 4d.; and at Christmas, 1864, it was 9s. 7d., being a benefit to the company of 7¼ per cent. At Christmas, 1863, the retorts per ton of coals was 1s. 5d.; at Christmas, 1864, 1s. 0¾d., being a benefit to the company of 25 per cent. Christmas, 1863, general wear and tear per ton of coals was 2s. 5½d., at Christmas, 1864, 2s. 9¼d., being 13¾ per cent. against the company. This would naturally arise from alterations made in enlarging the mains from Westminster to the eastern station, in order to supply the latter with more gas in foggy weather. The increase had been so enormous in the City, that they had been obliged to lay a large main to the eastern station. They had had a most ample supply, and in consequence a large increased rental in the City. At Christmas, 1863, wages and contingencies per ton of coals was 4s. 4¼d., and at Christmas, 1864, it was 4s. 6½d., being a decrease of 3¾ per cent. At Christmas, 1863, the rental realized per 1000 feet of gas was 3s. 11d.; at Christmas, 1864, it was 3s. 11½d., being an increase of 1 per cent. At Chrismas, 1863, coke for sale was 57 per cent. of coals used; at Christmas, 1864, it was 58 per cent. of coals used, being an increase of 1 per cent. on coke for sale. So that in every point of view they had good reason to be satisfied and to congratulate themselves on the working and prospects of the company. There were only two other points on which it was necessary for him to make any observations—one of these was their proposed reduction in price from Christmas next. They were all aware of the great agitation that had been lately going on with respect to the price of gas, and, as he thought, very improperly so. The great question was whether the public had a good article at a reasonable price, and his opinion was that they had. But as they found other companies lowering their price they had decided on doing the same, and reducing the price of cannel gas from 6s. to 5s., and of common gas from 4s. 6d. to 4s. That would be equal to a deduction of £20,000 a year, and no doubt for a short time it would have some effect upon the dividend, but they trusted not for any lengthened period; on the contrary, they were in hopes that with larger mains and the large new gasholder which they had just erected, they would meet with an adequate increase in consumption. They were taking every possible means to bring about this result, and if there should be any apparent diminution in dividend he hoped it would not be for long. The only other question he had to bring to their notice was to refer to the proceedings that were brought against them on the part of the Commissioners of Sewers in the City for giving them what they were pleased to call bad gas. As the proprietors were aware, the Commissioners of Sewers summoned them before a magistrate with the view of fining them £50 a day for the bad gas which they alleged had been supplied to them. The company were fully prepared to show, from their own tests of the gas, which they took every two hours, that so far from the gas ever being below, it had always been far above the requisite parliamentary standard. Well, proceedings were commenced, and they went on a whole day with their case, and on the second day, when the company were about to establish their defence and prove that they were right, the alderman discovered that he had no jurisdiction in the matter, and therefore they retired from the contest, after doing them all the damage they possibly could, the company having no means of showing that they were in the right. In one instance they went so far as to say that they had given them 9-candle gas. Now, he did not believe they had had half a dozen complaints in the whole City, but surely if they had come down from 13-candle to 9-candle gas, every man who burnt a light must have noticed so great a difference and have complained about it. It was clear, therefore, there must have been some mistake in Dr. Letheby's tests. They set the commissioners at defiance, and said our gas is good and we challenge you to prove it is not. He thought, however, they had heard the last of that, for it was extraordinary how good the reports had been ever since that time, and yet their gas was made in the same way as it always had been, neither more nor less care being bestowed on it, with the same means of manipulation and of sending it to the public.

A PROPRIETOR wished to know if anything contradicting the charge brought by the Commissioners of Sewers had been published in the press.

The CHAIRMAN said they had sent a letter to the *Times*, stating in what they considered Dr. Letheby to have been mistaken, but they had not inserted it, although they had published everything that had been uttered against them, without giving them the chance of a reply. There was one further observation which he had to make, and that was to call their attention to the following paragraph in the report:—"In conclusion, the present satisfactory position of the company affords to the directors a favourable opportunity to bring to the notice of the shareholders the zeal with which the officers of the company watch its interests, and the ability with which they discharge their several duties. They have therefore felt that, in presenting them with a gratuity of 5 per cent. upon their respective salaries, they have but anticipated the wishes of the proprietary at large." He felt quite sure that the proprietors would give their unanimous sanction to this proposal.

Mr. GRAY said with reference to the proposed reduction in the price of gas, it is quite true it might affect their dividends, but he felt sure the increased consumption would compensate for that, and they might look forward with confidence in a few years to realize the same dividends as they now enjoyed. It was true the poor gas companies were kicked at by everybody. The public grumbled at them, as a matter of course; but all they had to do was to discharge their duty to the public properly, at the same time not unmindful of their duty to the proprietors; and that had been the course of the Chartered Gas Company since its first incorporation. A reduction in the price was a matter of necessity. All the surrounding companies had made a reduction, and they were very unwilling to imitate the example, but it could not be avoided. He did not believe they would ever please the public, do what they liked, even if they went down to 3s. 6d. But what made the matter worse was, that though the quality of the gas had been so greatly improved, they tried to make out that it was worse. They had no alternative, therefore, but to do the best they could, and leave the public to grumble. With reference to the legal proceedings against them, he thought the alderman who heard the case ought to have stopped it *in limine*, and not let a one-sided statement go out to the public. Before sitting down, he would take the opportunity of expressing the pleasure he felt in supporting the motion which had just been proposed. Nothing contributed more to the success of a company than liberally remunerating its officers, according to their merits. In following that course they got willing officers, who would identify themselves with the company, and exert themselves with zeal to promote its interests. He had therefore much pleasure in proposing that this meeting do agree with and confirm the report of the court of directors and the auditors report and statement of the accounts of the company so transmitted.

The resolution was carried *nem. dis.*

A SHAREHOLDER suggested that they should insert a contradiction to Dr. Letheby's charge.

The CHAIRMAN thought it was quite unnecessary.

The Hon. Mr. BROWNE said it had been contradicted in all the papers, except in the *Times*.

Mr. BENNETT said he should be glad if the directors would let the meeting know when it was their intention to make the call referred to in the report. He asked the question at a previous meeting, and was told that it was not the custom to give the information. He thought it might probably be a great convenience to the proprietors if they knew when the call was likely to be made.

The CHAIRMAN believed the question the honourable proprietor asked before was, whether they were going to make any call at all, and that he declined to answer. This was a different question, and in reply to it he might say that they had not yet decided on the exact date, but his impression was it would be in the half year between June and Christmas. It was to meet the expense of the new gasholder.

Mr. BENNETT: What is the amount?

The CHAIRMAN: £10 a share, I believe.

Mr. EDENBOROUGH, referring to the report, wished to know what was the company's object in going to Parliament.

The CHAIRMAN explained that they expected a very great increase in the demand, which could only be met by enlarging their apparatus, and this could not be done on the works themselves, except at a very great expense, and even when that was done they were very bad; their idea, in fact, was to go out of London, and therefore they would have to get an Act before they could buy the land and lay their mains; and, of course, they would require additional capital. They thought this step would be productive of great benefit to the company.

Mr. RHODES wished to know if it would not be better that the directors should be elected at these half-yearly meetings. There would be no difficulty in calling a special meeting after this.

The CHAIRMAN said at present they could not do it, according to the Act; if they went to Parliament, they would get that.

Mr. RHODES asked if the bad debts were not unusually large.

The CHAIRMAN said he did not think they were. They were 908 against 927 the corresponding half year. He would venture to say that their bad debts were less in proportion than seven out of eight companies in London.

Mr. RHODES wished to know how it was this company did not make so much profit out of product, such as coke, tar, &c., as other companies did.

The CHAIRMAN thought they made more; but the use of Boghead coal alone would make a difference. It produced no coke, and they were obliged to use the coke of the Newcastle coal for the heats in making the Boghead gas. The Boghead coal produced no coke.

Mr. YOOL said, as one of the auditors, he might state that this company would always realize much less than others on account of the cost of cartage which they had to pay. Nearly all other gas companies in London had water carriage, but here they had to cart ashes and everything else away, which necessarily reduced the profits on product.

The CHAIRMAN said that since Christmas they had been selling coke at a higher price than any other company in London. They had been selling it actually at 17s. per chaldron, which, he believed, scarcely any other company in London had done.

Mr. RHODES suggested that the company should keep their own carts and horses instead of hiring them.

The CHAIRMAN explained that it would be a much less economic plan than the present system of hiring.

Mr. GRAY said they could not adopt a more effectual plan of diminishing their dividends than that of keeping horses and carts. It would be a most injudicious step.

Mr. PRICE thought the company might make a more profitable investment of their contingent-fund than by leaving it in the Three per Cent. Annuities. These funds were as low now as during the period of the Crimean war. With regard to the reduction in the price of gas, it was his opinion that it would contribute very much to the harmony between consumers and producers. Of course, there would always be a certain number of persons whom it would be impossible to satisfy, but still he entirely approved of the plan.

The CHAIRMAN said the contingent-fund was, of course, expressly to meet contingencies, and if they got it into other apparently better channels they might eventually lose by it. With respect to lowering the price of gas, he differed with Mr. Price; he did not think it would tend at all to increase the harmonious relationship of consumer and producer. He believed the public would never be content, make what reduction they pleased.

Mr. PRICE said that at any rate they would detach from what he might

call those incorrigible complainants, a reasonable portion of the public, so soon as they saw they were getting a fair supply of gas at a reasonable price.

The CHAIRMAN said that at Lewisham, in Kent, a new company started against the Phœnix, and to meet the public clamour for reduced rates the Phœnix lowered their price twice successively to 4s., and within a week the new company declared they could do it at 3s. 8d. He believed if they offered to do it for nothing the public would be dissatisfied.

Mr. PRICE differed with the chairman. Their protection was in Parliament throwing out such a bill. The Central Gas Company burnt their fingers, and they knew what they were thought of in the City. With regard to enlarging the mains, he strongly advocated the use of enlarged mains for the transmission of gas. He believed their extended introduction would be for the benefit of the company. He wished to know what were the largest mains the company had.

The CHAIRMAN said 36 was their largest; they had not got many of those, but since midsummer, 1852, they had laid out £44,000 in relaying and enlarging mains.

Mr. GRAY said, with regard to the conduct of the new company in Kent, alluded to by the chairman, it was most unreasonable. The fact was the engineer of the South-Eastern was the great mover in getting up the company, and what did the meeting think they were to do? Why, they were to charge the consumers 4s. or 4s. 2d., and this gentleman made a stipulation with them that they were to buy the land at a price they chose to put upon it; and, in addition, all the stations on that part of the line were to be supplied at the high remunerating price of 2s. 6d. Now he would like to know what dividend the proprietors would get from that. When application was made to Parliament for the bill they were prepared with scientific men to give evidence, but they found it unnecessary; the bill was condemned on the showing of its own promoters.

The SECRETARY read the following resolution from the directors minutes of the 25th of April, 1865:—Resolved: "That a dividend at the rate of £10 per cent. per annum for the half year ending at Christmas last, and a back dividend at the rate of 2½ per cent. per annum for the half year ending Christmas, 1858, be now declared, and reported to the general court to be holden on the 5th of May next."

Mr. SHERMAN moved—"That the dividend declared by the court of directors be approved and adopted, and be payable by warrants on the treasurer on and after the 15th of May inst."

Mr. RHODES seconded the resolution, which was carried unanimously.

The SECRETARY read a report from the directors, informing the proprietors that they had accepted the resignation of Mr. John Sewell. In consequence of his long period of service, the directors felt justified in awarding him a retiring pension of £80 a year.

Mr. GRAY: How long has Mr. Sewell been with us?

The CHAIRMAN: About 30 years.

Mr. GRAY suggested that they should make it £100 instead of £80. He thought 30 years faithful servitude entitled him to that amount.

The CHAIRMAN explained that their retiring annuities were regulated by a scale which they had had drawn up for that purpose.

Mr. RHODES then moved that the directors be empowered to pay Mr. Sewell the sum of £80 per annum as a retiring pension, which was seconded by Mr. BUTTER, and carried unanimously.

On the motion of Mr. RHODES, seconded by Mr. BUTTER, the court of directors were authorized, in pursuance of their report to the proprietors, to grant an advance in the salary of Mr. Upward.

This concluded the business.

Mr. PRICE proposed a vote of thanks to the chairman for his conduct in the chair, and to the directors for the ability with which they had conducted the business of the company for the past six months.

Mr. GRAY seconded the motion, which was carried with applause, and the meeting separated.

CANTERBURY GAS CONSUMERS COMPANY.

On the evening of the 1st inst., a general meeting of the shareholders of the Canterbury Gas Consumers Company, Limited, was held at the Music Hall, Canterbury, for the purpose of receiving from the directors "a report of the provisional arrangement made with the directors of the Canterbury Gas Company, and confirming the same or otherwise." There was a large attendance, and the chair was occupied by PETER MARTEN, Esq., chairman of the board of directors.

The CHAIRMAN explained the negotiations which had taken place between the directors of the two companies, and which had resulted in the provisional adoption of an agreement. The terms of that agreement were, in his opinion, highly favourable to the gas consumers, and it remained for that meeting to adopt them or not as they thought proper.

The SECRETARY (Mr. J. W. Pilcher) then read the agreement, the exact terms of which were as follow:—

1. The gas company to reduce the price of gas to 4s. per 1000 feet on and from the 1st of July, 1865. A clause to be inserted in the proposed new Act that 4s. shall be the maximum price per 1000 feet within the city and borough, while the price of coals does not exceed 20s. per ton; if coals exceed that price, the rate to be increased *pro rata*.

2. The gas to be of the illuminating power described as 14-candle gas, and the testing apparatus to be open to inspection at the gas-works at all times without previous notice, and sufficient pressure to be applied to ensure an ample supply by day and night for cooking and other purposes.

3. On taking the meters, a ticket to be left with each consumer showing the quantity consumed during the preceding quarter.

4. The old company to apply to Parliament for an Act to increase their capital and for further powers connected with the manufacture of gas and supply of water, and to come under the Gas Clauses Act. A clause to be inserted in such Act limiting the dividend to 8 per cent. per annum; and any profit made beyond this per centage to go in reduction of the price of gas to the consumer. The draft of such bill to be submitted for approval to the directors of the new company, and if in accordance with the terms now arranged, and approved by the shareholders, to be unopposed by the new company.

5. The board of directors to be increased to 12, and two-thirds of the directors to be chosen from shareholders duly qualified who are resident in the city and borough of Canterbury. The qualification for a director to be the holder of ten shares.

6. The shares in the new capital required to be £10 each, and to be allotted amongst the shareholders of the Gas Consumers Company in Canterbury, *pro rata*, who shall make application for the same; and the present shareholders of the old company are not to have any shares allotted until after the same shall have been previously offered for 21 days to the Gas Consumers Company. The present £50 shares to be reduced to 5 shares of £10 each.

7. Upon the passing of the Act the new company to be dissolved.

Mr. J. ABRAHAMS said he was one of the consumers of gas who were first to publicly direct attention to the high price charged for, and the bad quality of the gas supplied by the old company, and he thought the agitation had produced the most eminently satisfactory results. At no place in the county of Kent, except at Maidstone, could gas be obtained at so low a price as the maximum fixed by the agreement. To secure the good quality of the gas, the consumers would have the power to examine the testing apparatus at all times. The corporation had the power to appoint a gas inspector, and he thought they ought to do so, as the expense would be trifling. The formation of a gas consumers company had brought the old company to their senses. He had very great pleasure in proposing the following resolution:—"That the shareholders of the Canterbury Gas Consumers Company are of opinion that their directors have maturely studied their interests in the provisional management made with the Canterbury Gaslight and Water Company, and fully authorize them to adopt and carry out the same."

Mr. HIGHAM, one of the directors, expressed his satisfaction with the arrangement. The old company had conceded more than he expected they ever would when the question was first taken up. In his opinion the most important portion of the agreement was that under which the consumers of gas could obtain a controlling power at the board of management.

Mr. N. JACOBS, another director, recommended the shareholders to adopt the arrangement, believing, as he did, that it would secure to the gas consumers all they wished for. He reviewed the difficulties which had stood in the way of the Gas Consumers Company, in order to show that the directors had not neglected the interests of the shareholders. They should never have advised the shareholders to accept terms less favourable than those set forth in the provisional agreement, and even then they were in a position to go on with the company, if the meeting thought proper.

Mr. WM. CANNON, jun., seconded the motion proposed by Mr. Abrahams, which he trusted would be unanimously adopted. He thought the arrangement made showed that their directors had studied the interests of the shareholders, as the terms were more favourable than they had a right to expect, taking all the circumstances into consideration. He thought that if the new gas company had gone on it would have been a good thing, but the arrangements made were still better, because they would not entail the continual breaking up of the streets by rival companies.

The motion was then put, and carried unanimously, and the proceedings terminated with a vote of thanks to the chairman.

METROPOLIS GAS SUPPLY.

REPORT OF THE SPECIAL COMMITTEE OF THE COMMISSIONERS OF SEWERS ON GAS.

To the Honourable the Commissioners of Sewers of the City of London.

Court of Sewers, Guildhall, Feb. 28, 1865.

We, whose names are hereunto set, your special committee on gas, appointed the 14th day of June last, do certify, that we have met frequently to consider the various matters referred to us, and to take such other proceedings as we found necessary, to enable us to discharge our references, and we now beg to lay before you our report thereon.

The resolution of your honourable court, by which we were appointed, was as follows:—Resolved—

"That the citizens of London have, for a long time, been suffering from an insufficient supply of gas, and, that supply being under the superintendence and charge of the Commissioners of Sewers, a sub-committee be appointed for the purpose of ascertaining the cause of such insufficiency, with power to make such investigation, and take such steps, as may appear desirable, with a view to its improvement, both in quantity and quality, and to ensure to the consumer a more pure and brilliant light."

We also had the following reference made to us—viz., on the 25th of October, 1864—

"To confer with the gas companies, supplying the City of London, with a view to obtaining a reduction in the price of gas to that which was charged by them from the passing of the Great Central Gas Company's Act, 1851, until the year 1860; and, in the event of the committee failing in that object, to consider and report as to the advisability of applying to Parliament for powers to obtain a reduction in the price; and further, to secure to the citizens of London the advantages, in respect of gas supply, they formerly possessed, and any other powers which may be generally beneficial to the ratepayers and gas consumers of the City."

And, on the 11th of October, 1864—

"To obtain, at an expense not exceeding 50 guineas, the opinion of Mr. Hawksley, as to the best mode of reducing the amount of sulphur in gas."

And, on the 10th of January, 1865—

"To consider the question of the commissioners manufacturing their own gas, and to report thereon, to this court, as early as they conveniently can."

We also, from time to time, had the following documents referred to us:—

On the 5th of July, 1864—

The report of Mr. Barlow, civil engineer, made to the gas companies supplying the City of London, upon the subject of the purity of gas, and specially relating to the sulphur compounds contained therein.

The reports of your gas analyst, Dr. Letheby, of the 9th and 16th of July, the 27th of August, the 8th and 29th of October, and the 19th of November, 1864, relating to the purity and illuminating power of gas.

On the 14th of June, 1864—

The report of your engineer, Mr. Haywood, in relation to the deficiency of light at the public lamps by the King William statue.

On the 27th of September, 1864—

The letter of Mr. Greenfield, requesting that examination and a trial, should be made of his carburetting apparatus, on one of the large lamps opposite the Mansion House, under the direction of your officers, but at his own expense.

We had, also, referred to us the following memorials, &c., from inhabitants of the City of London, viz.:—

On the 25th October, 1864—

From the vestrymen of the parish of St. Dunstan in the West, complaining of the impure quality, deficiency of illuminating power, and high price of gas supplied in the City.

On the 1st November, 1864—

From the inhabitant householders of the parish of St. Andrew, Holborn, in vestry assembled, to the like effect.

A resolution from the vestry of St. Mary-le-Bow, to the like effect, and requesting your honourable court to take into consideration the propriety of taking the manufacture and supply of gas in the City into your own hands.

A resolution from the vestry of the united parishes of St. Mary-le-Bow, St. Pancras, Soper Lane, and Allhallows, Honey Lane, to the like effect.

On the 22nd November, 1864—

A petition from the ward of Farringdon Within, complaining to the like effect, and praying the commissioners to undertake the supply of gas within the City.

From the members of the Aldgate Ward Ratepayers Association, complaining generally of the gas, and the provisions of the Act of 1860, and suggesting that the commission should purchase the mains of the gas companies in the City, and manufacture and supply gas, or obtain such supply by public tender.

On the 6th December, 1864—
A petition from the inhabitants of the ward of Cripplegate Without, complaining of the impure quality, deficient quantity, and high price of the gas, and praying that steps may be taken to relieve them from the injurious monopoly, in the supply of gas, under which they now suffer.

On the 10th January, 1865—
A memorial from the inhabitants of Leadenhall Market, complaining of the deficient supply of gas.

On the 14th February, 1865—
A memorial from the vestry of St. Ann, Blackfriars, praying that measures may be taken to supply them with a better gas, and at a lower price.

We must here state that, as the question of the gas supply to the City has occupied the attention of your honourable court for a long time past, and a different committees of the commission have had the subject under their consideration, and during the last three years especially, much investigation and many experiments have been made, which have from time to time been reported to you by those committees, and by Mr. Haywood and Dr. Letheby, we thought it desirable to have collated and arranged for us the principal information which has thus been accumulating for some years, and directed Mr. Haywood and Dr. Letheby to undertake that work, which they have accordingly done, and their report we append.

Before entering on our various references, we desire to draw your attention to the former conditions of gas supply to the City, so far as they relate to the formation of the Great Central Gas Consumers Company, and the circumstances which subsequently led to the passing of the Metropolis Gas Act of 1860.

An experiment was made in 1807 in lighting part of Whitecross Street and Beech Street with gas. In 1810 the Chartered Company obtained the first gas Act, and its lighting powers extended to the cities of London and Westminster, and the borough of Southwark. In 1817 the City of London Gas Company obtained an Act to light nearly the same area. Mains were first laid in the City in 1814, and on the 9th of November in the following year the Guildhall was, for the first time, illuminated by gas. In that year, also (1815), the Chartered Company for the first time lighted certain streets in the wards of Cornhill and Cripplegate, under contract with the commissioners.

In 1822 Sir William Congreve, who had been appointed on the part of the Crown to inquire into the gas supply of the metropolis, advised that districts should be assigned to the companies. This was opposed by them; but in 1823 an Act was passed carrying his recommendation into effect. The City was then divided between the Chartered and City of London Gas Companies, the City Company having that portion which comprises the western and southern parts of the City, the Chartered Company that which comprises the northern and eastern parts of the City, and this boundary-line of supply of the two companies continues to the present day.

Thenceforth competition was at an end, and the gas supply of the City was a monopoly in the hands of those two companies. It is true they appeared annually before the commission, upon the occasion of tendering for lighting the public streets; but the commission had only to accept their tenders, or the alternative of adopting an inferior mode of street illumination. At these meetings, it was the custom to draw the attention of the companies to the reduction in the price of gas which competition was effecting in the districts surrounding the City, and it was then that the companies announced their intentions as to reducing or retaining their then existing price of gas to the citizens for the ensuing year.

In the year 1823 the price of gas was 15s. per 1000 cubic feet. By gradual reductions it had fallen to 7s. in 1844; and, upon the repeated and earnest requests of the commission, a still further reduction was made, in 1847, to 6s. per 1000 feet.

Dissatisfaction continued to be felt at the last-named price. It was contended, by those skilled in gas manufacture and sale, that the City was entitled to a much greater reduction; and, indeed, that, owing to its large concentrated consumption, it was entitled to gas at a lower price than any other portion of the metropolis; and it was intimated to the companies that competition might, if offered, be accepted by the commission, unless further reduction was at once made. The reduction to 4s. (which was the price then considered by the commission to be an equitable one) was not immediately insisted upon; but the companies were required to state whether they would, by gradual reduction or within a reasonable period, lower the price of gas to 4s. per 1000 cubic feat. This the companies positively and definitely refused to do, stating that it would be impossible to supply gas profitably at that price, and they declined giving any guarantee that it should be reduced below 6s. It was this refusal which led to the organization of the Great Central Gas Consumers Company.

The promoters of the Great Central Gas Consumers Company started with the proposition that the City was, from its local conditions, entitled to have gas cheaper that the rest of the metropolis. They also, under the advice of skilful professional men, averred that 4s. per 1000 feet would be largely remunerative. The project for the formation of their company was supported by a body of citizens and gas consumers, both numerous and influential; and the commission, having no prospect before them of the reduction of price in gas, to that which they were advised the citizens were entitled, gave the new company its support. The consequence was, the promoters of the Great Central Company applied to Parliament in 1849, and again in 1850, for an Act, but in both years unsuccessfully.

In 1849, the directors of the company applied to the commission for permission to lay down pipes in the City, and offered to execute a deed by which they would bind themselves to supply gas to the consumers in the City at a price "never to exceed 4s. per 1000 cubic feet;" and further, to reduce the charge to 3s. 6d. and 3s. whenever they could pay a dividend of 10 per cent. to their proprietors. The commission, relying on the promises made, accepted the offer, and a deed, dated February 12th, 1850, between the Great Central Gas Consumers Company and the Commissioners of Sewers, was accordingly executed for carrying out the arrangement. The promoters were allowed to lay down pipes, and, with the large influence they thereby gained, they applied for and obtained, in 1851, an Act of Incorporation, as the Great Central Gas Consumers Company, and entered into their first contract with the commission for public lighting in that year. Extracts from the deed referred to are given in the Appendix, page 49.

The Great Central Gas Consumers Company may, therefore, be said to owe its existence chiefly to the commission; for although, in 1849, the other companies, stimulated by fear of competition, had reduced the price to 4s., yet the commission supported the new company, in the entire faith that 4s. per 1000 cubic feet would be henceforth the maximum price of gas in the City, and might, ultimately, be still further reduced, and that the compact entered into with the commission (and subsequently incorporated in the company's Act of 1851) would be permanently binding; the result was that the citizens had gas supplied to them at 4s. per 1000 feet until the passing of the Metropolis Gas Act, 1860.

About the year 1857, the gas companies surrounding the City combined with the view of arranging districts and stopping competition. A body of delegates, from various local boards of the metropolis, met to defend the public interest against the coalition, and the result was that parliamentary committees were appointed, in the years 1858 and 1859, to inquire into the metropolitan gas companies, and ultimately the Metropolis Gas Act was passed in 1860.

It was generally understood that the Metropolis Gas Act was, in its main features, when first brought into Parliament, in unison with the views of the metropolitan delegates. It was introduced into Parliament early in 1860, and on the 2nd of April was referred to a special committee of the House of Commons, consisting of the Right Hon. J. Sotheron Estcourt (chairman), Mr. Packe, Mr. North, Mr. Turner, and Lord R. Cecil, who, after hearing evidence for many days, arrived at certain decisions on the 18th of June, which were apparently so favourable to the public, and so distasteful to the gas companies, that the latter withdrew altogether from before the committee, which concluded its labours on the 25th of June.

The gas companies meanwhile employed themselves in raising opposition to the bill upon its third reading, and were so successful that they obtained its recommittal. The committee to whom it was referred did not meet again until the middle of July (a very late period of the session); and ultimately the Act passed in its present shape, the gas companies having obtained the withdrawal from it of those features which they considered prejudicial to their interests.

Your honourable court had the bill under its consideration, but being advised by the City remembrancer that the bill did not affect the City of London, and relying implicitly on the contract already referred to, offered no opposition to the bill in its progress through Parliament, and it passed into law.

In 1861 the three companies supplying the City raised the price of gas to 4s. 6d. The commission, feeling strongly the course taken by the Great Central Gas Company, took counsel's opinion as to the power of that company to raise the price; subsequently, a special case was agreed to between the commission and the Great Central Gas Company on the subject, which was argued before the Court of Common Pleas in 1862, and that court decided that the company had power to raise the price to 4s. 6d.; and this judgment was, upon appeal by the commission, confirmed by the Court of Exchequer Chamber.

We now advert to the charges for public lamp lighting of the City.

The price paid for 5-feet burners was £5. 5s. in 1823, and had been reduced to £4. 4s. in 1850; competition then ensued, and the charge gradually fell, until, in 1853, the price of the Great Central Company was £3. 3s., and that of the Chartered Company £2. 19s. 6d., which prices were continued until 1855.

There is reason to believe that arrangements were made in 1856 between the several companies as to the charges for public lamps, for in that year they were increased to £4. 4s. and £4. 2s. per lamp, or a rise of about 33 and 37 per cent. respectively.

In 1861 the Great Central Company, feeling itself no longer restricted by the deed with the commission and their original Act of Parliament, and the other companies being thereby freed from the involuntary competition which those obligations had caused, the prices went still higher, and gradually rose until, in 1864, thay reached £5. 8s. 6d. and £5. 9s. 6d. per lamp per annum, which prices are being paid this year.

Thus, the present price per lamp per annum is about 4¼ per cent. dearer than it was in 1823, when gas was at 15s. per 1000 feet, and 84 per cent. above the lowest price charged in 1853, when gas was at 4s. per 1000 cubic feet. In 1853 the cost of the public lighting of the City was about £8700, whilst in the present year it will be about £15,700. After making allowance for the increase in the number of lamps since 1853, the excess of cost, owing to increased charges, is about £6500 per annum, or equal to the rate of more than 1d. in the pound upon the assessed value of the City property.

Your officers have reported to us that they estimate the private consumption of gas in the City to be about 1000 million cubic feet annually, which, at 6d. per 1000 feet, gives £25,000 as the excess of that which would have been paid had gas remained at 4s., and to this has to be added the increased cost of public lighting. It will be seen, therefore, how large a sum of money is now paid by the citizens, owing to the abrogation of the compact made by the Great Central Company with the commission, in 1850; while it is clear that the advantages which were intended to be given by the Metropolis Gas Act have not been realized in return for the increased price. The grounds for this statement will be seen from subsequent parts of our report.

The foregoing circumstances are among the most important to be kept in mind in considering the matters to which we hereafter advert; and, having drawn your attention to them, we proceed to the consideration of our references.

The subject-matters contained in the various documents, referred to us, may be divided into the following classes:—

1. Complaints as to defective street lighting.
2. As to deficiency in the supply of gas to private consumers.
3. As to the inferior illuminating power of the gas.
4. As to impurities in the gas.
5. As to the high price of the gas.
6. Consideration as to the propriety of the commission seeking powers to take upon itself the manufacture, supply, and sale of gas in the City.
7. As to the commission purchasing the mains of the gas companies, and establishing a manufactory for the supply of gas; or laying down their own mains, and obtaining the supply of gas in bulk by public tender.
8. As to the best means of obtaining a reduction in the price of gas, an increase in the quantity, and an improvement in its quality.

As to the Public Lighting.

In former times this service was well performed by the companies, but, for many years past complaints have been made of deficiency of light. The measures taken to remedy this have been—the obtaining the co-operation of the police, to report upon the worst cases of defect; the appointment of a clerk of works, specially to investigate the nature of the defects in the lighting, and other matters connected with the gas supply to the public lamps—and, by fixing meters to lamps in various parts of the City, to ascertain the consumption of gas. The whole of these points have been, at intervals of time, reported on, and been under the consideration of your honourable court, and are fully set forth in the report of your engineer and gas analyst.

The reports of the police show, that during the year 1863 about 2½ lamps in each night were seriously defective, and, considering that there are 2884 lamps in the City, this cannot be regarded as a very great amount of defect.

The public complaints, however, have not been directed so much to cases of extreme defect (which class of defect will probably occur in a degree under any system) as to the deficiency in light, at the lamps generally. This deficiency cannot have escaped the observation of any one, and all the investigations of the last few years show, that there has not only been a de-

ficiency in the quantity of gas supplied, but a general neglect of most of those conditions, necessary to be observed to secure efficient public lighting.

Upon the subject of the carburetting process, we think it needful to make but few remarks, it having been discontinued within your jurisdiction.

When the process was first brought under the notice of the commission, the expense for public lighting was largely on the increase. You were, therefore, desirous of doing all you could to economize under this branch of expenditure.

An experiment was directed to be made by your officers, and was reported by them to be successful. They were of opinion that a saving of about 20s. per lamp per annum might be effected by the use of carburators, thereby reducing the expenditure of the commission under this item, by about £2300 per annum; and, as the increased illuminating power given by the naphthalization of gas had long been a well-established fact, there seemed every reasonable hope of this expectation being realized, and, accordingly, the process was adopted in the southern district of the City.

It was at once evident that the process would have the determined opposition of the gas companies. Their refusal to apply it—the subsequent determination of one of the companies not to supply gas to the public lamps where the carburators were used—the requirement of double taps to the apparatus, and other circumstances—prove this antagonism to have existed throughout the period that the process was employed, and this alone rendered its successful application, to say the least, problematical.

The commission persevered, but had to struggle with many difficulties; and as the system did not give public satisfaction, your honourable court decided to discontinue it.

It must not be supposed, however, that the defective public lighting existed solely in the southern district, were the carburators were used. It has been complained of throughout the whole City.

And it may be here desirable to state, that burners, calculated to consume 5 cubic feet of gas per hour, had been exclusively employed at the public lamps for some years until the carburetting process was partially adopted, and that 3-feet burners were only then employed where that process was applied.

(*To be continued.*)

SETTLEMENT OF THE CLAIMS ON THE SHEFFIELD WATER COMPANY.—The directors of the Sheffield Water Company have issued a circular, in which they state that the total amount claimed against the company for damage done by the bursting of the Bradfield reservoir was £455,164; and the amount of claims to be paid by the company, as determined under the Inundation Commission, was £276,821, being little more than three-fifths of the amount claimed. The directors estimate that not more than £13,000 will be required to meet those claims, and the yet unpaid costs.

THE CHEAP GAS MOVEMENT AT GRAVESEND.—On the 4th instant, a deputation, appointed at a numerous meeting of gas consumers, had an interview with the directors of the Gravesend and Milton Gas Company. The deputation consisted of Messrs. Bryant, Crook, Strickland, Fagge, Fenwick, and Kelner; and the directors of the gas company present were Messrs. Spencer, Munns, Oakes, Wood, Ditchburn, Woodford, Winnett, T. Troughton, and J. Gould. The deputation applied to have the price of gas reduced from 5s. to 4s. per 1000 cubic feet, and, in support of the application, enumerated a number of towns in Kent at which the price ranged from 3s. 8d. to 4s. per 1000 feet. At no place of any importance was the price so high as at Gravesend, except Tunbridge Wells. At that town, the houses were distributed over a large area; hence the expense of supplying gas was heavier than at Gravesend. Mr. Crook, one of the deputation, said that nothing less than a reduction of 1s. per 1000 feet would satisfy the consumers, and that, unless their application were favourably considered, a public meeting would be convened to consider what further steps should be taken. The chairman of the directors replied that the board were not then in a position to reply definitely to the application. They would, however, take it into consideration prior to the half-yearly meeting of the shareholders in June, when the application would be finally decided upon.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited)	20 0 0	5 0 0	19 to 20
1000	20	Do., preference	20 0 0	10 0 0	
20000	5	Bombay (Limited)	5 0 0	5 0 0	5⅜ to 6
10000	5	Do., first issue	3 0 0	5 0 0	3½ to 3⅝
10000	5	Do., second issue	1 0 0	5 0 0	¾ 15 0
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29½ to 30
8200	20	Do., new (Norwich, Hull-Sculcoates, Shelton, Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27¼
12000	50	*Chartered*	50 0 0	10 0 0	78 to 80
6000	50	Do.	30 0 0	10 0 0	49 to 51
10000	20	*C. of London*, Ash.	20 0 0	20 0 0	30 0 0
10000	10	Do., B shares	10 0 0	4 0 0	15 to 16
8000	10	Do., new shares	10 0 0	10 0 0	7½ to 7¾
		City of Moscow (L.)	4 0 0		3½ to 4
		Colonial & General			
11697	25	*Commercial*	25 0 0	10 0 0	42¾ to 43½
5771	25	Do., new shares		10 0 0	
		Continental G. & W.			
20000	20	Continental Union	10 0 0	8 0 0	10¾ to 11
5827	5	County & Gen. (L)	5 0 0		5 to 5¼
2000	5	Do., preference	5 0 0	6 0 0	
		(Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)			
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 17⅝
5000	10	Do., preference	10 0 0	6 0 0	12½ to 12⅝
4000	50	*Equitable*	50 0 0	10 0 0	84 to 86
4000	25	Do., new shares	21 0 0	10 0 0	36 10 0
23406	10	European (Lim.)	10 0 0	10 0 0	13 5 0
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	7 0 0
18540	10	*Great Central Gas Consumers*	10 0 0	10 0 0	17 to 17½
		Hong Kong (Lim.)			
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	86 to 86
1300	100	Do., bonds	£100	10 0 0	198 0 0
7000	25	Imperial Austrian	10 0 0		10 to 10¼
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	13 14 3	88 17 6
4000	40	*Independent*	40 0 0	10 0 0	71 to 73
4904	50	*London*	50 0 0	10 0 0	80 to 82
5519	25	Do., 1st pref.	25 0 0	6 0 0	29 to 30
1921	50	Do., 2nd pref.	50 0 0	6 0 0	
870	50	Do., 3rd pref.	50 0 0	6 0 0	
20455 *l*		Do., 1st pref. sk		6 0 0	
13608 *l*		Do., 2nd pref. sk		6 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	6 0 0	
100000	1	Oriental, Calcutta	1 0 0	7 10 0	1½ to 1⅝
50000	1	Do., new shares	0 10 0	7 10 0	⅝ to ¾
10000	5	Ottoman & Smyrna (Limited)	5 0 0		3 to 4
10000	10	Pará (Limited)	10 0 0		10½ to 11
9000	60	*Phœnix*	60 0 0	10 0 0	89½ to 90½
3600	100	Do., new	10 0 0	7 10 0	14 to 15
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	18 0 0	10 0 0	35 to 37
		Rio de Janeiro (L.)			
		Singapore (Lim.)			
		Shanghai			
4000	50	*South Metropolitan*	50 0 0	10 0 0	81 to 83
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15¼ to 16
7000	10	Do., new	4 0 0	10 0 0	6½ to 7¼
9000	50	United General (Dublin & Limerick)	50 0 0	4 12 0	36½ to 37½
10000	10	*Victoria Docks*			
1500	10	*Wandsworth & Putney*	10 0 0		
1500	10	Do., new shares			
20000	10	Western (Limited) A shares	10 0 0	10 0 0	16¼ to 16½
10000	10	Do., B shares	5 0 0	10 0 0	8¾ to 9¼
		Do., C shares	2 0 0	10 0 0	4 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares	3 0 0	7 10 0	3 17 6
		West London Junction (Lim.)			

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
3¼ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¾ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1¼ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

COALS.—*Per Ton.*

Newcastle.—Unscreened.	6s. 3d.
Burnhope	
Lanchester Pelaw	6 6
Whitwell Primrose and West Wear	6 9
Medomsley, Eighton Moor, and Ravensworth Pelaw	7 0
Pelaw and North Pelton	7 3
New Pelton, Peareth, South Pelaw, Washington Hutton, West Leverson, and South Peareth	7 6
Pelton	7 9
Ramsay's Newcastle Cannel	16 0

Scotch Cannel.	45s. 0d.
Boghead (at Leith)	
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	29 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (F. O. B. at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton.	
Chatham and Rochester	5 9
Cork	9s. 6d. to 10 0
Dover, Folkestone, & Ramsgate	6 3
Dublin	10s. to 10 6
Exeter Quay	8 6
Ipswich	5 6
London (from Leith)	8 6
London (Pool)	6 0
Lowestoft and Yarmouth	4 6
Portsmouth & Southampton	7 0
Plymouth	7 9
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel.	
Barcelona	£25 0
Bordeaux	15 0
Boulogne and Calais	7 10
Cadiz	17 0
Copenhagen	8 0
Genoa	24 0
Hamburg	8 0
Havre de Grace	9 5
Leghorn	23 0
Lisbon	15 0
Rotterdam	7 5
Stettin	10 10
Trieste	23 0
Venice	25 0

SUNDRIES.

	£2	15s.	0d.
Best Newcastle Fire-bricks—per 1000 £2.10s. to			
Cliff's Fire-bricks (at Wortley)—per 1000	2	15	0
Ingham's ditto (at Wortley)—per 1000	2	15	0
Fire-clay Retorts—per foot run 5s. 6d. to	0	7	0
Tough Cake Copper—per ton	91	0	0
English Pig Lead—per ton	20	0	0
Welsh Bar Iron (in London)—per ton	7	12	6
Foreign Spelter—per ton	21	5	0
English Block Tin—per ton	97	0	0
Banca—per ton	98	0	0
Tarred Rope Yarn—per cwt.	1	6	0

CONTENTS.

	PAGE
Notes upon Passing Events:—	
The Reformatory Union Exhibition at the Agricultural Hall	417
Proposed Anglo-French Working Men's Exhibition	417
Sir John Thwaites	417
Rejection of the Park Lane Improvement Bill	418
The Non-Charitable Clubs	418
Circular to Gas Companies:—	
Rejection of the Stroud Provisional Order by the Committee of the House of Commons	419
Rejection of the Imperial Gas Bill and the United General Gas Bill	420
The Liverpool United Gas Bill in the Commons	420
Judgment of the Queen's Bench as to Taxed Costs on Appeals against Assessment	420
Approaching Meeting of the British Association of Gas Managers	420
Discovery of Cannel Coal in New South Wales	420
Correspondence:—	
The Hanley Gas Bill	420
Register of New Patents:—	
Applications for Letters Patent	421
Grants of Provisional Protection	421
Notices to Proceed	421
Patents which have become Void	421
Parliamentary Intelligence:—	
Progress of Bills in House of Lords	421
Progress of Bills in House of Commons	423
House of Lords Committee—Stroud Gas Bill	424
House of Commons Committee—Liverpool United Gas Bill	431
Legal Intelligence:—	
Court of Queen's Bench—In *re* the Sheffield Gaslight Company, Appellants; the Overseers of the Poor of the Township of Sheffield, Respondents	436
Miscellaneous News:—	
Metropolis Gas Supply—Report of the Special Committee of the Commissioners of Sewers on Gas	
Discovery of Cannel Coal in New South Wales	439
Dr. Whitmore's Report on the Quality of the Gas supplied in St. Marylebone, in April, 1865	439
Dr. Whitmore's Report on the Quality of the Water supplied in St. Marylebone, in April, 1865	439
Folkestone Water-Works Company	439
The Woolwich Equitable Gas Company	439
Settlement of the Gas Question at Folkestone	440
The Sale of Spanish Gas-Works	440
Share List of Metropolitan Gas Companies	439
Price Current	439

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, June 13, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MAY 30, 1865.

Notes upon Passing Events.

SINCE our last "Notes," another Industrial Exhibition has been opened, with all the importance that royalty and the highest dignitary of the Church could bestow, and closed with doubtful success. The Reformatory Union collected in the Agricultural Hall specimens of the work produced in philanthropic establishments not only in Great Britain and Ireland, but in several states of North and South Germany, Holland, France, Belgium, Italy, and other countries still more remote. A special feature of the exhibition were the workshops and workrooms, in which several hundred boys and girls followed the trades and occupations they are taught in the different homes and asylums. The girls did all kinds of women's work, and the boys made brushes, chopped wood, made shoes, and turned tops in wood, and exhibited themselves as carpenters, blacksmiths, and other handycrafts. This was very interesting, and this part of the exhibition will, no doubt, have the intended effect of obtaining support for these institutions where children are not only taught out of books, but how to be useful and to earn their bread. But the very feature which rendered this exhibition interesting to the consuming classes, damned it in the eyes of the million, on whose support any shilling or sixpenny show must depend. The name of the exhibition conveyed the idea of a collection of young criminals. As a matter of fact, a considerable number of the workers came from asylums for the blind; from the cripples home, and from the shoeblack brigades; from asylums for destitute children and for young vagabonds whose greatest crime was the want of a parent's home. The goods came not only from the institutions before named, but from idiot and lunatic asylums. Among the articles exhibited there was little demanding or deserving special notice, although the works of the blind and the idiot asylums were very encouraging. There was nothing so absurd as that pair of hunting-breeches at the West London Industrial Exhibition, ticketed "Art Manufacture." The foreign goods showed more taste than those from English institutions, which were nearly all severally useful. The prettiest stand, from Milan, showed some excellent specimens of a sort of basket-work, and some exquisite picture-frames from Signor Feretti's Protestant Orphan School at Florence; Syria sent gold embroidery; all the German societies plenty of knitting and worsted-work. Some very barbarous examples of locks and ironwork were there, apparently to show how completely the taste of the foreign workman fails in plain household metal-work. However, almost everything was sold. It is said that the working classes regarded the exhibition with some disgust and indignation, from two causes. First, they protested against the luxuries and care bestowed on boys whose qualification was supposed to be crime; next, they objected to teaching trades, without passing each lad through the guild of a shop, and seven years apprenticeship. The general conclusion to which we come is, that from time to time exhibitions of work done in asylums and reformatories should be held, but that, at the risk of making the show less attractive, the young workers should be kept out of sight, and not made actors in a popular industrial drama.

Undismayed by the total failure of the last working men's exhibition at the Floral Hall, where the public decline to visit what they have already seen at the Agricultural Hall and Lambeth, we see from a circular that what is called an Anglo-French Working Men's Exhibition is to be held at the Crystal Palace in the autumn—which means, stripped of fine language, that something between a bazaar and a fancy fair will be held in that attractive place at the time named. To confine such a show to the produce of working men only would be to exclude the result of machinery and capital. If the articles exhibited are good or pretty, or both, it may be a pleasant addition to the concerts, the fountains, and the unrivalled gardens. It will be a kind of Crystal Palace Fair. We hope no fine art notions will prevent the managers from encouraging sales, for it is the shop element that will make an exhibition that is to last so long succeed. People will not buy to receive at the end of three months, and as there are "as good fish in the sea "as ever came out of it," gaps will soon be filled. The rock most to be feared is the display of rubbish in art or manufactures because it is the produce of a working man. It would be just as rational to give prominence to some daub or ugly toy because the author was a teetotaller, or a loyalist, or a democrat. It is all very well to reward children for efforts towards excellence, but he is no friend of the working man who treats him as a child to be coaxed, petted, and praised for wretched failures. The good workman who can make something worth exhibiting deserves to have his name and address known, that he may get more work and more wages, but the cant of working men's shows, consisting of articles commonly sold in shops, like the before-mentioned breeches, ought to be discouraged.

The authorities at the South Kensington Museum have been the means of creating four or five committees for the purpose of founding, in as many quarters of London, museums where those who would like to study the arts connected with their

trades at South Kensington, if it were nearer, may have close at home models, casts, pictures, and designs given, purchased, or lent for that purpose. Lord Granville offers to give a section of the "Boilers" to each committee that can secure and dedicate a plot of ground in perpetuity to a museum of useful arts. The gift will not represent more than £1000, or, at most, £2000 to each; but it will be a germ of exertion, and will be useful if it only prevents any committee from starting with too large a building, which would inevitably be a temptation to accept all sorts of unsuitable specimens of so-called art in order to fill it. There are few exhibitions more melancholy and ridiculous than a museum in a third-rate town, either in this country or on the Continent, where you may see, for instance, a stuffed tiger, a fine picture, and a piece of ugly and historical patchwork.

The committee of the House of Commons have rejected the Metropolitan Board Bill for opening Park Lane into Hamilton Place. This makeshift had only one merit—its supposed cheapness. That disappeared or became doubtful in committee, and so the Bill sank by its own gravity, like a weight hanging on a burst bladder. It is not of much consequence, for those who have waited so long can wait a little longer; and if West London is fortunate, a bishop may be lamed or a royal duke upset in Park Lane. Then the Metropolitan Board, backed by an angry public opinion, will summon up courage and prepare a more comprehensive scheme at greater cost. It is true that every year makes property more valuable, and, of course, compensation more costly; but the public, which also grows richer, must pay for its parsimony. It is, on the other hand, with unmitigated regret that we note the rejection of the South Kensington New Road Bill, because if the opportunity of cutting through a large vacant space be once lost, it can never be regained. Private persons proposed to speculate in a new street from Sloane Street to the South Kensington Museum, five-eighths of a mile in length and 150 feet wide, with rows of trees on either side. The profit was to be derived from first-class mansions, facing what may be called the boulevard. The Bill was rejected apparently on the ground, often stated before, that the compulsory powers ought not to be given to a mere building speculation. At least, so we presume, as the opposition was of the feeblest possible character, consisting of a few owners or lessees of small houses about Brompton; while the scheme was supported by "the vestries of Chelsea and Kensington, by all "but a minute per centage of the property-holders, by the "authorities of the Museum and Horticultural Gardens, and "by the evidence of the engineer of the Metropolitan Board "of Works, and by eminent architects." It will be remembered that last year a bill for sweeping away the slums of Holywell Street, and carrying out in that part of the Strand the improvements which will be commenced by the central Palace of Justice, was rejected on the same grounds. As there is no chance that the large powers and large funds which have made Paris so magnificent will be granted to any central authority in London, our only chance of street and architectural reform depends on granting to speculating street-building companies the compulsory powers so freely granted, on good cause being shown, to railway and dock companies. Let us have a commission to inquire into the street improvements required, or let the Metropolitan Board make out a bold and comprehensive scheme, and go to Parliament for power to transfer compulsory powers to joint-stock companies, which would enable them to buy enough spare land to recoup themselves for their loss in streets, pavement, &c. This difficulty in the way of metropolitan improvements is one which might be effectively taken up by Mr. Tite, whose reputation as an architect would secure the attention of the House of Commons.

Sir John Thwaites has more than ordinary reason to be proud of the honour conferred on him by Her Majesty. It is a compliment to the Metropolitan Board for the manner in which they have performed the most important public work as yet attempted in London, and it is still more an acknowledgment of the satisfactory manner in which the chairman has filled a very difficult office, both as regards the public and his Board. There were very strong and natural prejudices against Sir John when he was elected, and the best proof of his merit is that he has survived them.

A hot dispute is being carried on in the *Times* on the question whether a club ought or ought not to subscribe to local charities. The club in question is the Athenæum, which has rejected a proposal to subscribe £50 to St. James's parish charities—in spite of the eloquence of the Bishop of Oxford and the zeal of Lord Lyttelton—by a large majority. Both parties have encumbered the dispute by arguments that injured their respective causes. The one anti-subscriber maintained that all charities were useless or mischievous; and another that a subscription would subject the club to proceedings in chancery. As to the desirability of public charities to supplement the bare assistance to which the destitute are legally entitled under our poor laws, it is too large a subject to be dismissed in a paragraph. We can only say now that when such principles are carried into practice by Parliament, wealthy, aristocratic England will not be a very safe place to live in during times of distress. But perhaps a principle so abstract is not worth arguing, since it can never be carried out. Indeed, there never was a time when those who have money—we will not say the rich—were less inclined to button up their pockets against claims of real distress, on reasons of pure political economy. As to the legal objection, it is trumpery; it is just one of those objections that lawyers are in the habit of thrusting into private affairs, to which, if people do not want an excuse, the least possible attention is paid. The fact is, that the ordinary commercial business of life could not be carried on if we listened to all the possible legal difficulties raised by a smart attorney or a briefless barrister. Arguments equally feeble are used on the other side; as, for instance, that the men of fashion who are supposed to frequent clubs draw into the parish of St. James a great number of journeymen tailors, bootmakers, and others of that class; and that these people when in distress have a claim on their masters customers. The argument arises out of the confusion between the terms "working men" and "poor men." Edmund Burke, a century ago, protested vehemently against considering men poor because they laboured. Of all classes there are none who less deserve the relief of special charities than the west-end journeyman tailor, bootmaker, carpenter, house-painter, &c. These men earn excellent wages—higher wages than most clerks, or curates, or ushers in schools. They also belong to powerful wealthy societies. Distress amongst them can only arise from sickness, intemperance, and improvidence. Sickness has a special claim, which is always acknowledged. But after allowing for the large per centage of distressed souls who flock to London as a haven of hope—families without friends, without health, or strength, or clothes, to take work if offered—there can be no doubt that there remains another large per centage of paupers created by indiscriminate charity. Where the carcase is, there the vultures are gathered together. Where Radical speculators, like Mr. White, make political capital in stump speeches about the number of paupers in England, some one should be found courageous enough to answer that paupers are numerous because relief, both legal and purely charitable, is so easily granted. In no other country has the pauper so clear and easy a claim to relief; because in this country it is not a question of police. A workman applying for relief in England has not to produce either a passport or a book endorsed by his last master, as in France or Germany. Again, our scale of living is so much higher, as well as our scale of clothing, that a man calls himself poor here, who would be considered well off in those parts of the Continent where respectable labourers wear *sabots* without stockings, and are clothed in a pair of blue linen trousers and a short smock, called a *blouse*, and live on black bread, cabbage, and sour cider. We should like to know the authority or experience of those who assert that the peasantry of Belgium and Northern France and Germany are better off than the majority of our labouring men, who have a thousand opportunities of rising in the world denied to the labourer of Northern Europe. We exclude always from our consideration the condition of the inhabitants of those climates where the sun supplies the want of coals and clothes, and where a hunch of black bread and an onion, afford all the nutriment needed in the absence of frost, rain, and east winds. Our agricultural labourers in certain districts are badly enough off at times, no doubt, but they have always chances of migrating to better places and pay; on the other hand, does any one know in London where a superfluous carpenter, painter, or slater, is to be hired? Does not every lady find the greatest difficulty in getting a dressmaker to work at her house, or a woman in the suburbs to help to wash and iron? The scarcity of skilled labour is notorious to every employer. It would be difficult to prove that political institutions have anything to do with the distress amongst the unskilled, the ignorant, and the improvident.

Circular to Gas Companies.

The complete defeat of the Stroud Provisional Order in the Local Government Supplemental Bill (No. 3) will afford more gratification to the gas companies of the United Kingdom than any other proceeding before Parliament connected with their interests during the present session. We felt confident, indeed, that no committee would confirm an order which was so unjust an attack on private enterprise. The establishment of a precedent giving parliamentary authority to a Local Board to compete with an established gas company, placed under the provisions of the Gas-Works Clauses Act, would have created a panic among the holders of shares in gas companies. There was not, however, the least ground whereon to rest the confirmation of the provisional order, which had been virtually withdrawn by the Home Secretary himself; and the committee, without hearing any of the witnesses against it, declared that they could not recommend its confirmation by the House of Commons. The clauses and schedules relating to Stroud were, therefore, struck out of the Bill.

The whole course of proceedings in the matter is highly instructive, and deserves to be recapitulated as an instance of the extent to which a spirit of animosity, and the desire to obtain additional power, may actuate the majority of the members of a Local Board in their opposition to a gas company, to the sacrifice of the interests of the ratepayers. By an Act of Parliament passed about 40 years ago, the commissioners of Stroud were empowered to light that town with gas, and that power has been transferred from one governing body to another, and now vests legally in the Local Board of Health. The power was never exercised, and a gas company was formed for lighting the town, under the sanction of the local authorities, who entered into a contract with the company for lighting the public lamps for 21 years. That contract ended in 1855, when new arrangements were made with the gas company. Not long after the constitution of the existing Local Board dissatisfaction was expressed at the supply of gas, and disagreements arose between them and the company. Gas agitators were ready to fan the flame of discontent, and at length the Local Board resolved to bring into force the obsolete power which had been transferred to them of lighting the town with gas, in competition with the existing company, which had been established for upwards of 30 years. That power the old commissioners had virtually, if not legally, abandoned and transferred when they made arrangements with the gas company to light the town, and gave them permission to open the streets to lay down their mains. But the Local Board nevertheless exhumed the musty Act of Parliament from the borough records, and tried to put it in force by the aid of the authority conferred by the Local Government Act on the Home Secretary to issue provisional orders for altering, repealing, and extending the provisions of local Acts. They accordingly applied to him for a provisional order to extend the borrowing powers of the Board, for the purpose of the erection of gas-works. The manner in which such provisional orders are obtained was strikingly exemplified in the Stroud case. An inspector was sent down from the Local Government Office to make inquiries on the spot, and he attended one morning at the town-hall "to hear the persons desirous of being heard on the subject of "this inquiry." These inquiries, it was stated before the committee, by the clerk of the Local Board, "are generally of a "free nature, in which anybody says what they please that is "pertinent to the subject." On the information thus gained, by a person unacquainted with the real facts of the case, and ignorant most probably of all that relates to the manufacture or supply of gas, a report to the Home Secretary is made, recommending the issue of a provisional order; and, in the case of Stroud, the clerk of the Local Board admitted that he himself had supplied some materials for the report. The perusal of it is sufficient to prove the dangerous nature of the inquisitorial power thus entrusted to an individual, who undertakes, on the evidence submitted to him in the course of a brief inquiry, "in which anyone says whatever he pleases," to recommend the adoption of measures that may seriously, and to a large extent, affect the interests of important classes of the community. This summary mode of extending the powers of Local Boards, and of altering or repealing local Acts, is not sufficiently controlled by requiring the sanction of Parliament, and the utmost vigilance is necessary on the part of gas companies to prevent local authorities from procuring, in this surreptitious manner, powers that they would not be able to obtain in the regular course of parliamentary proceedings. Important matters, which an inspector decides in an hour or two in a random, off-hand manner, usually occupy the attention of committees for several days. On his recommendation the Home Secretary issues a provisional order, which in some cases may immediately become law. It would have been so with the order issued relating to Stroud, and there would have been no necessity for any application to Parliament had not the Local Board already raised an amount of money equal to one year's assessable value of the property in the town of Stroud. The confirmation by Parliament of the order was therefore rendered necessary, and the case submitted to the committee by the Local Board was sufficient to prove the injustice of their proceedings, without any rebutting evidence. Had it not been for the accident that the amount already borrowed slightly exceeded the yearly assessable amount of Stroud, the Local Board would have been empowered by the provisional order alone to have erected gas-works to compete with the existing company. The gas company, it may be observed, were before Parliament last year to procure statutory powers, and to place themselves under the provisions of the Gas-Works Clauses Act; but the Local Board offered no opposition, and they refused to enter into any arrangement with the company on that occasion respecting the public lamps, having already applied to the Home Secretary for a provisional order to enable them to establish gas-works of their own. The case of the Local Board was the more flagrant, as they received two intimations from the Local Government Act Office that, after the Stroud Gas Company had obtained parliamentary power, the Secretary of State did not think it desirable to introduce a Bill to confirm the provisional order. The first letter was written in June last, soon after the company had obtained their Act. It was signed by Mr. Tom Taylor, and stated that the Secretary of State was of opinion that, as the Stroud Gas Company had obtained their Act, Parliament would hesitate before confirming an order for the establishment of gas-works by the Local Board. No answer was returned to that letter, but in March last the Local Board again urged the Home Secretary to bring in a confirming bill. Mr. Tom Taylor replied that he was instructed to say that the Stroud order would only be introduced into a confirming bill containing opposed orders, and he suggested that it might be expedient, before proceeding further in the matter, that the Local Board should satisfy themselves, by a public meeting, that they were acting in accordance with the wishes of the ratepayers in pressing the order in the face of the gas company's opposition. He also suggested the propriety of coming to terms with the company for the purchase of their works, should the Local Board undertake to light the town with gas. The Local Board, however, were not to be deterred by any representations of the Home Secretary. They had obtained his provisional order, and were determined to put it in force if they could. It appears from the evidence of Mr. George Holloway—who represented himself to be an outfitter, one of the largest ratepayers of Stroud, and a member of the Local Board—that that body thought the suggestions and recommendations of the Home Secretary, through Mr. Tom Taylor, "were of very "little weight;" that it was presumptuous in him to speak for both Houses of Parliament as to what would be the effect of the application of the board; and "in fact we looked upon "his letter as a piece of impertinence." Looking on Mr. Holloway, the outfitter, as the representative of the Local Board of Stroud, we cannot be surprised that they should have pertinaciously persisted in squandering the ratepayers money in supporting such a case; and the disgraceful termination of their pig-headed obstinacy is the necessary consequence. Though the letters of Mr. Tom Taylor were not thought worthy of an answer by the Local Board of Stroud, they will be regarded by all who are less self-opinionated as containing excellent suggestions which ought to have been adopted. They were written in a highly commendable spirit tending to produce conciliation. It was in a similar spirit that he wrote to the Local Board of Weston-super-Mare in April, last year; and in that quarter his advice was not without effect.

We cannot leave this subject without adverting to the want of discretion, to say the least, shown by Mr. Morgan, the inspector of the Local Government Act Office, on whose report the Stroud Provisional Order was granted, in appearing in the committee-room among the supporters of the order. The compulsory powers to take certain lands inserted in the order relating to Bradford, also issued on his recommendation, were disallowed by the same committee. The effect of his presence

among the partisans of the Local Boards must necessarily weaken his authority, and tend to throw doubts on the impartiality of an official to whom is entrusted the decision of questions that may greatly affect the value of private property.

The extraordinary opposition raised by the bishops in the House of Lords to the Imperial Gas Company's Bill was successful in causing its rejection, on the question of the second reading, by a majority of three; the numbers being 46 against 43. One archbishop and eight bishops voted against the Bill, which appears to have been made a Church question. There is something so unusual in this proceeding that it is difficult to explain the cause. The observations of Lord Ravensworth against the Bill exhibited a degree of ignorance of the subject somewhat astonishing. He raised three objections to the extension of the company's works, in not one of which was there any substantial foundation. The first was, that it would add greatly to the pollution of the atmosphere; that it would therefore injure the health of the neighbourhood generally, and be specially detrimental to the training college of St. Mark's. The notion that a gas-work is injurious to health is one of the figments of a past age; and had the Bill been allowed to go before a committee, it would have been satisfactorily proved that no such effect is produced. The training college of St. Mark's is exposed to another kind of nuisance, far more objectionable than the works of the Imperial Gas Company. Punch's railway passes close to the college, and from 90 to 100 engines daily vomit forth under the windows volumes of coal smoke, creating a nuisance that is attributed to the gas-works. The next allegation, that the Bill "would aggravate the evils of a gigantic "monopoly for which the public had no remedy whatever, "however impure and defective the quality of the gas supplied "to them might be," shows an entire ignorance of the provisions of the Metropolis Gas Act, by which ample remedies ara provided against any abuse of the powers conferred on the gas companies. The third allegation, that much of the "foul "refuse" of the Imperial Gas Company's works found its way into the Thames, would have been amply refuted had the Bill been allowed to go into committee. The Bishop of London was still farther from the truth when he attributed the noxious state of the atmosphere at Bow Common to the gas-works. Manufactures of manure, bone burning and boiling, chemical-works, and every kind of manufacturing process that occasions real pollution of the atmosphere is carried on in that neighbourhood, the works of the Great Central Gas Company there tending rather to purify the tainted air than to add to its contamination. It was in vain that Lord Portman, Earl Granville, and Lord Redesdale endeavoured to persuade their lordships to refer the Bill to a select committee instead of adopting the very unusual course of throwing it out on the second reading; but the bishops had been whipped up to vote, and they succeeded in rejecting the Bill.

The rejection by a committee of the House of Lords, on Saturday last, of the Bill of the United General Gas Company to extend their works in Dublin, at Kingstown, and at Bray, adjourns for another year the consideration of the gas supply of Dublin. The witnesses of the company admitted that of the £425,000 which had been expended by them in Dublin, about £123,000 had been paid for works that are now unproductive. A clause in the Bill nevertheless fixed the capital of the company in their gas-works in Dublin, Kingstown, and Bray, at the full amount of £425,000, on £60,000 of which the dividend was to be limited to 6 per cent., but on the remaining £365,000, it was to be 10 per cent. A sentence in the preamble declared that it was expedient "that the provisions *hereinafter contained* should be made "for regulating the powers of the company," among which were those relating to capital, and it is probable that it was in consequence of those provisions not appearing satisfactory to the committee that the preamble of the Bill was declared not to have been proved.

The renewed opposition in the House of Commons of the Corporation of Liverpool, the Guardian Society, and the Tradesmen's Guild, to the Bill of the Liverpool United Gas Company, after it had passed the House of Lords, has been of little avail. The point principally contested was the proposed allotment of the new capital among the existing shareholders, and that the company carried; the whole of the capital required is to be so allotted. It was conceded by the company that the standard of illuminating power should not be less than 20 sperm candles instead of 18 wax, as it stands in their old Act. In the purity clause there has been substituted for the words that the gas should be "as far as reasonably practicable" free from impurity, the phraseology of the old Act, that the company shall supply "the best and purest "gas." An attempt was made to force the adoption of the 20 grain purity clause of the Metropolis Gas Act, but it was vigorously resisted, and was finally abandoned.

We direct attention to a report in our legal intelligence of an important judgment of the Court of Queen's Bench, in a case submitted to the court for their opinion as to the principle on which the costs of overseers of the poor should be taxed when supporting their assessment of gas-works. In the case in question the costs of the overseers of the poor of Sheffield, in supporting an assessment on the works and mains of the Sheffield United Gas Company, amounted to £1962. 13s. 10d., but they had been reduced by the taxing officer of the Quarter Sessions to £238. 4s. 9d., and the judgment of the court confirms his decision.

The second annual general meeting of the British Association of Gas Managers will be held this year at Birmingham, on Wednesday and Thursday next. On the first day, Mr. Hawksley, the president of the association, will deliver an inaugural address, after which papers will be submitted to the meeting on the following subjects:—"On Gasholders, and "their Tanks and Connecting-Pipes," by Mr. Cathels; "On "Open-ended Clay Retorts," by Mr. T. H. Methven; "On "the Distillation of Coal at Various Temperatures," by Mr. A. C. Fraser; and "On Gas Registers," by Mr. T. Newbigging. In the evening, a lecture "On the Present State of the "Chemistry of Gas Lighting" will be delivered by Dr. Letheby. Arrangements are made for the members to visit several of the large establishments in the neighbourhood of Birmingham, where the manufacture of gas-tubes, fittings, &c., is carried on, after the conclusion of business on Thursday morning. We hope there will be a full muster of gas managers on the occasion, to support so valuable an institution for promoting improvements in the manufacture of gas.

A brief paragraph in our miscellaneous news announces the important discovery, in New South Wales, within 80 miles of Sydney, of a workable seam of cannel, which is said to surpass Boghead in the richness of its quality. Its yield of gas per ton is reported to be equal to 17,500 cubic feet of gas, of 31-candle illuminating power. Should the supply equal the anticipated quantity, it is possible not only that the East Indies, China, and South America may be supplied with cannel from that source, but it may be available to supply even Great Britain itself, should the consumption of cannel increase as it threatens to do if the requirements of gas legislation for increased illuminating power are to be complied with.

Correspondence.

THE HANLEY GAS BILL.

SIR,—I have read your article upon the parliamentary contest between the proposed Hanley Gas Company and the British Gaslight Company.

There is only one point which I wish specially to call your attention to, because your arguments (unintentionally, I doubt not) are entirely opposed to facts, and you will be glad to be set right.

You lay it down that the Hanley Company was promoted by the "Towns Protection Agency"—*i.e.* (as I gather), by Mr. Hedley and those with whom he has of late frequently been associated.

Mr. Hedley stated in his evidence (as you will find on reference to the official minutes of evidence) that his first introduction to the company was by a letter from me, inquiring if he was at liberty to act as engineer to a gas company in opposition to the British Company. In addition to this, strong evidence was given by the local witnesses as to the purely local character of the company.

At the close of the promoters case, I was tendered as a witness to set at rest the question of promotion by strangers. The committee expressed their complete satisfaction on that point, and the British Company did not venture to ask me a single question.

I should have proved, and I now assert, that the local dissatisfaction was first expressed in August, 1863. In November, 1863, the British Company announced an intended reduction of 3d. per 1000 cubic feet. The next week this reduction was publicly denounced by one of the borough magistrates as "contemptible;" the following week the local press described it as "paltry;" and on the 10th of December, 1863, the Town Council authorized a memorial to the British Company designating the reduction as "insufficient and scarcely appreciable."

As early as April, 1864, the first steps were taken for forming a local company. In June, 1864, I was referred to Mr. Hedley by a friend in Warwickshire, and I at once wrote to Mr. Hedley, as stated in his evidence. He was till then a complete stranger to me, and I believe to Hanley also.

The formation of the company was (as was proved in evidence) authorized at a meeting of the principal inhabitants of Hanley on the 15th of July, 1864.

No company could have a more completely local origin, and it is only due to the people of Hanley that your readers should know this.

MATT. F. BLAKISTON.

Hanley, May 20, 1865.

[If Mr. Blakiston be correct in the assertion that no company could have a more completely local origin than that of the Hanley Gas Consumers, it must be admitted that appearances were most unfortunately against them. The fact that the temporary office of the company was at the office of the consulting engineer in London was not calculated to indicate local origin. The employment of all the staff of the Towns Protection Agency in promoting the bill indicated a close connexion with the office to which applications for shares were to be directed; and the distribution of shares among attorneys clerks in London was not a happy method of showing that they were in great request at Hanley.]

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1330.—ALEXANDER WEIR, of Greenock, in the co. of Renfrew, N.B., for "*Improvements in water-gauges and cocks.*" May 13, 1865.

1334.—WILLIAM CLARK, of 53, Chancery Lane, London, engineer, for "*Improvements in gas-burners and chimneys.*" A communication. May 13, 1865.

1350.—WILLIAM EASTON, of Gateshead, EDWARD MOORE, of South Shields, and WILLIAM GILLIES, of Gateshead, for "*Improvements in the construction of pumps for raising water and other liquids.*" May 15, 1865.

1361.—GEORGE WALTON, of Weardale Villa, the Downs, Clapton, for "*Improvements in apparatus used in distilling hydrocarbons.*" May 16, 1865.

1364.—FIELDING FLETCHER, of 15, Fordrough Street, Birmingham, plumbers brass-founder, for "*Improvements in water-closets.*" May 17, 1865.

1370.—WILLIAM RICHARD WILLIAMS, of Northumberland Court, Charing Cross, London, gas engineer, for "*Improvements in dry gas-meters.*" May 18, 1865.

1381.—GEORGE HENRY BROOKES, of Sheffield, for "*Improvements in sliding gas-pendants or chandeliers.*" May 19, 1865.

1386.—WILLIAM DAVEY, of the Imperial Tar-Works, White Post Lane, Hackney, London, for "*Improvements in apparatus for washing or purifying coal gas, and for producing ammoniacal water therefrom.*" May 19, 1865.

1392.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*Improvements in apparatus for raising oil and other liquids from deep wells.*" A communication. May 20, 1865.

1393.—JOHN AMBROSE COFFEY, of 17, Gracechurch Street, London, consulting engineer, for "*Improvements in distilling apparatus.*" May 20, 1865.

1395.—WILLIAM SMITH and GEORGE BROWNE SMITH, both of Kennington, London, gas-meter manufacturers, for "*Improvements in wet gas-meters.*" May 20, 1865.

1411.—EDWARD M'NALLY, of Manchester, engineer, for "*Certain improvements in apparatus for cutting or forming screws, which is also applicable for cutting pipes or tubes.*" May 23, 1865.

1424.—JOHN AMBROSE COFFEY, of 17, Gracechurch Street, London, consulting engineer, for "*Improvements in the retorts used in the manufacture of gas and in other distillations, which improvements are adaptable to evaporating vessels.*" May 25, 1865.

1437.—GEORGE BRAY, of Leeds, for "*An improved gas-burner.*" May 25, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1242.—CARL GUSTAV LENK, of Dresden, now of 6, Lawrence Lane, Cheapside, London, chemist, for "*An improved process for purifying water.*" May 3, 1865.

1266.—ISRAEL SWINDELLS, of Wigan, Lancaster, chemist, for "*Improvements in the manufacture of coal gas.*" May 6, 1865.

1269.—PETER ARMAND LE COMTE DE FONTAINEMOREAU, of 10, Rue de la Fidélité, Paris, and 4, South Street, Finsbury, London, for "*Certain improvements in apparatus for illuminating purposes.*" A communication. May 8, 1865.

1287.—WILLIAM JACKSON, of Glasgow, for "*An improved method of mixing gases and vapours, and in the machinery or apparatus connected therewith.*" May 9, 1865.

1296.—EDWARD MYERS, of Millbank Row, Westminster, civil engineer, for "*Improvements in wet gas-meters.*" May 10, 1865.

1311.—GEORGE MOUNTFORD, of Grasscroft, York, manager, and EDWARD WORROLL, of Upper Mill, York, plumber, for "*Improved apparatus for cutting, turning, and smoothing metal pipes and the surfaces of bolts, rods, or spindles.*" May 11, 1865.

1361.—GEORGE WALTON, of Weardale Villa, the Downs, Clapton, for "*Improvements in apparatus used in distilling hydrocarbons.*" May 16, 1865.

NOTICES TO PROCEED.

85.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, London, for "*An improved apparatus for cutting iron, gas, or other pipes.*" A communication. Jan. 11, 1865.

86.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, London, for "*Improved pincers for gas and other pipes.*" A communication. Jan. 11, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1191.—JOHN ENDEAN, "*Improvements in cocks, taps, and valves.*" April 24, 1862.

1196.—JOHN WINSBORROW, "*Improvements in wet gas-meters.*" April 24, 1862.

1204.—RUDOLF ZIMARA, "*Improvements in stoves for heating and ventilating buildings.*" April 24, 1862.

1224.—WILLIAM EDWARD NEWTON, "*Improvements in chimneys for lamps.*" A communication. April 25, 1862.

1231.—SQUIER CHEAVIN and GEORGE CHEAVIN, "*Improvements in filtering and purifying water, and in apparatus employed therein.*" April 26, 1862.

1234.—HERBERT WILLIAM HART, "*Improvements in the manufacture of reflectors and shades for gas and other lights.*" April 26, 1862.

1284.—HENRY WILLIS, "*Improvements in valves for the supply and discharge of gaseous bodies.*" April 30, 1862.

1289.—CHARLES PIERRE ALEXANDRE DOUCHAIN, "*Improvements in apparatus for letting in or shutting off water or other liquids.*" May 1, 1862.

1304.—ALFRED VINCENT NEWTON, "*Improved electrical apparatus applicable to the lighting of gas.*" A communication. May 2, 1862.

1311.—JEAN MARIE HERDEVIN and JOSEPH ALEXANDRO JULLIEN, "*Improvements in sluice-cocks.*" May 3, 1862.

1414.—HENRY WILLIAM SAINBRIDGE "*Improvements in sliding chandeliers, gaseliers, and other pendent lamps.*" May 10, 1862.

1516.—TIMOTHY MORRIS and ROBERT WEARE, "*Improvements in obtaining and applying light and heat by electricity.*" May 19, 1862.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

1007.—WILLIAM HEAP, "*Improvements in pipe-joints or couplings.*" May 6, 1858.

1055.—ALEXANDER PARKES, "*Improvements in the manufacture of tubes and cylinders.*" May 11, 1858.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MAY 15.

The BELFAST GAS Bill was brought from the Commons, read a first time, and referred to the Examiners.

The ROSS IMPROVEMENT Bill.—The Select Committee reported that they had not proceeded with the consideration of the Bill, no parties having appeared in opposition thereto. The Bill was committed for Thursday, the 18th.

The BIRMINGHAM WATER; NEWTOWN WATER; and RHYL DISTRICT WATER Bills, were read a second time, and committed.

The RUNCORN, WESTON, and HALTON WATER Bill was read a third time, with the amendments, passed, and sent to the Commons.

The HORSFORTH WATER; DEWSBURY, BATLEY, and HECKMONDWIKE WATER; and CARNARVON NEW WATER Bills, were referred to a Select Committee, consisting of Lord Churston (chairman), Viscount Lifford, Lord Wharncliffe, and Lord Oxenfoord, who will meet on Thursday the 18th of May, at eleven o'clock.

TUESDAY, MAY 16.

The BATH GAS; BRISTOL WATER; and WEST WORTHING IMPROVEMENT Bills, were returned from the Commons, with the amendments agreed to.

The BRIERLEY HILL GAS; LITTLEBOROUGH GAS; NEATH WATER; and PRESTON GAS Bills, were reported, with amendments.

The GAINSBOROUGH WATER Bill was read a second time, and committed.

The FAREHAM GAS Bill was read a third time, and passed.

The GOSPORT GAS and the RASTRICK GAS Bills were read a third time, with the amendments, passed, and sent to the Commons.

Petitions were deposited against the IMPERIAL GAS Bill, from the Vestry of and owners, &c., of property in Chelsea; R. Gunter; J. Veitch; G. H. Tod Heatly; and the Guardians of the Poor of St. Luke's, Chelsea;—and against the CHELTENHAM WATER Bill, from the inhabitants of Cheltenham.

THURSDAY, MAY 18.

The ROSS IMPROVEMENT AND LLANELLY LOCAL BOARD OF HEALTH Bills were reported, with amendments.

The HORSFORTH WATER Bill.—The Select Committee reported that they had not proceeded with the consideration of the Bill, no parties having appeared in opposition thereto.

The SOUTHAMPTON GAS Bill and the WEST BROMWICH IMPROVEMENT Bill were brought from the Commons, read a first time, and referred to the Examiners.

The EXMOUTH GAS and the CRYSTAL PALACE DISTRICT GAS Bills were returned from the Commons, agreed to.

The EXETER GAS (No. 1.) Bill was read a third time, with the amendments, passed, and sent to the Commons.

FRIDAY, MAY 19.

The RIPON LOCAL BOARD Bill was brought from the Commons, read a first time, and referred to the Examiners.

The St. Albans Water; Tyldesley-with-Shakerley Local Board; Chesterfield Water and Gas; and Winchester Water and Gas Bills, were returned from the Commons, with the amendments agreed to.

The Horsforth Water Bill was reported, with amendments.

The Cheltenham Water Bill was read a second time, and committed.

The Brierly Hill Gas; Neath Water; Preston Gas; and Littleborough Gas Bills, were read a third time, with the amendments, passed, and sent to the Commons.

The Glossop Water and the Birmingham Water Bills were referred to a Select Committee, consisting of Lord Silchester (chairman), the Earl of Caithness, Earl Nelson, Viscount Strathallan, and Lord Heylesbury, who will sit on Monday, May 22, at eleven o'clock.

Monday, May 22.

The Dewsbury, Batley, and Heckmondwike Water Bill was reported from the Select Committee, with amendments.

The Crays Gas and the Torquay Gas Bills were brought from the Commons, read a first time, and referred to the Examiners.

The Runcorn, Weston, and Halton Water Bill was returned from the Commons, with the amendments agreed to.

The Gainsborough Water and the Rhyl District Water Bills were reported, with amendments.

The Galway Water Bill was reported, without amendment.

The Glasgow Corporation Water Bill was read a second time, and committed.

The Ross Improvement Bill was read a third time, with the amendments, passed, and sent to the Commons.

The Cheltenham Water Bill was referred to a Select Committee, consisting of the Duke of Cleveland (chairman), the Earl of Shrewsbury, the Earl of Dartmouth, Lord Blantyre, and Lord Scarsdale, who will sit on Friday, May 26, at eleven o'clock.

Tuesday, May 23.

The Rastrick Gas Bill was returned from the Commons, with the amendments agreed to.

The Glossop Water Bill was reported from the Select Committee, with amendments.

The Horsforth Water Bill was read a third time, with the amendments, passed, and sent to the Commons.

Friday, May 26.

The following Bills received the Royal Assent:—Bath Gas; Bristol Water; West Worthing Improvement; Fareham Gas; Exmouth Gas; Crystal Palace District Gas; St. Albans Water; Tyldesley-with-Shakerley Local Board; Chesterfield Water and Gas; Winchester Water and Gas; and Rastrick Gas.

The Ripon Local Board Bill was referred to the Standing Order Committee.

The Belfast Water and the Southport Improvement Bills were brought from the Commons, read a first time, and referred to the Examiners.

The Birstal Gas; Littleborough Gas; Brierley Hill Gas; Preston Gas; and Drighlington and Gildersome Gas Bills, were returned from the Commons, with amendments agreed to.

The Glasgow Corporation Water Bill was reported, without amendment.

The Carnarvon New Water Bill was reported from the Select Committee with amendments.

The Kidderminster, Stourport, and Bewdley Water and the Belfast Water Bills were read a second time, and committed.

The Rhyl and District Water and the Gainsborough Water Bills were read a third time, with the amendments, passed, and sent to the Commons.

Imperial Gas Bill.—On the motion that this bill be read a second time,

Lord Ravensworth, who was most imperfectly heard in the gallery, rose and asked their lordships not to consent to the second reading of this bill. This was not a usual course to adopt in reference to a private bill; but as the case was an exceedingly strong one, and the injuries which would be caused by the bill were so enormous, he felt that no other course was open to him but to oppose the bill on the second reading. He asked their lordships attention for a short time, while he told them what it was that the bill proposed to accomplish. Previously to doing so, however, he must remark that the measure had caused the greatest consternation in the whole neighbourhood, on which it would inflict both injury and injustice, without being productive of the slightest public convenience. The demands made by the Imperial Gas Company had already grown to an enormous magnitude. The original capital of the company was £260,000; and it was now sought to increase the capital to £2,600,000, with borrowing powers to the extent of £886,000, and a land acreage of 153 acres. Under the existing powers, independently of these demanded by this bill, the company had reached an enormous magnitude; and perhaps it was the largest company in the world. His first objection to the bill was, that the proposed extension of the company's works would greatly add to the existing pollution of the atmosphere and the consequent injury to health, which they already occasioned to a neighbourhood, the population of which are rapidly increasing. New streets of a very respectable character had been built in the neighbourhood, and many villas had been erected; and the emanations from this gas manufacture, already so injurious, would be augmented. The right reverend prelate who presided over the diocese, in a speech which he delivered a short time ago on the subject, mentioned the fact that the great and important training college of St. Mark's, on which no less a sum than £50,000 had been expended, was situated in close proximity to the company's gas-works. He supposed that the direct distance between the college and the gas-works was not more than 100 yards; and the deleterious vapours emanating from the gas-works were most prejudicial and injurious to the inmates of that institution, and offered a serious objection to their further extension. Any stranger on passing these works at night might imagine that some great conflagration was going on within. The whole atmosphere was lighted up by the gas; and the emanations were carried by the wind into the neighbourhood, effectually destroying vegetation, as well as proving injurious to human and generally to animal life. This he could answer for from his own experience. At the present moment, independently of what was asked for in this bill, most extensive operations were going on, no less than between 200 and 300 men being employed on the works. This was the first point on which he opposed the further extension of these works—namely, pollution of the air, and injury to health and vegetation. The second objection he had to urge was, that if the Legislature granted this bill they would augment the evils of a most gigantic monopoly—a monopoly extending over a vast area, against which the public had no remedy whatever, however impure and defective the quality of the gas supplied to them might be in this most extensive district. A third objection was, that the works of the company were situated at a distance of not more than 150 or 200 yards in a direct line from the Thames, into which much of the foul refuse of the manufacture of gas was carried, as he had seen with his own eyes. Already the works had been extended to six times the area originaly contemplated. On all these grounds he objected to granting to the company the power they now asked for, of doubling their present works and raising money to an enormous extent. He begged leave to move that the second reading of the bill be deferred to that day three months.

Lord Portman said it was a very unusual course to throw out a bill of this kind on the second reading, and thus refuse to allow it to undergo that thorough investigation before a select committee which it especially required. Undoubtedly their lordships might say that this was a bill which should proceed no further; but the statements made a few nights ago by the right reverend prelate at the head of the diocese were so astounding that he asked permission to offer a few remarks. The promoters of the measure had sought an interview with the right reverend prelate, in order to clear up some misconception under which the right reverend prelate had been labouring in regard to the bill, and to explain to him certain facts which he had not correctly stated; but the right reverend prelate had not complied with their request. In his (Lord Portman's) opinion, however, when a peer of Parliament made an inaccurate statement affecting a public company in a case like the present, he ought not to refuse to hear their explanation. Instead of making a demand for 150 acres, which might have been enough to frighten the right reverend prelate and all their lordships, the entire space required by the company consisted of only three plots, of 9 acres, 14 acres, and 13 acres respectively; so that there would be only 36 acres instead of the 150 spoken of by his lordship. Then, as to the pollution of the Thames, how stood the case? The company could not now legally discharge their refuse into the Thames. The company would incur a very heavy penalty, under the present law, if they permitted any parties to throw their refuse into the Thames. This was the present law; and the company asked for no power by this bill to allow them to get rid of their refuse in that way. The noble lord opposite (Lord Ravensworth) said he opposed the bill on public grounds. On public grounds he (Lord Portman) asked their lordships to give it a second reading. As to the company having a monopoly, noble lords would be pleased to remember that, not long ago, Parliament decided that the metropolis should be divided into separate districts, which should be supplied with gas by certain companies. The houses in the boundaries of the district assigned to the Imperial Gas Company had so largely increased, that it became absolutely necessary for the company to enlarge their works in order to supply its wants. Some measure of the kind was therefore necessary. In committee the bill might be thoroughly sifted, and clauses introduced if found to be necessary to protect the private right. The parties objecting to portions of the measure might be heard before the committee, and their lordships would do them justice, as they always did. The company had taken 9 acres more at Fulham, and reduced their works at the other end of the town. No doubt there was a disagreeable smell connected with the making of gas in large quantities; but this was inevitable in the manufacture of gas, and he would remind the noble lord that this would be the case in any new locality as well as in the present. He trusted that their lordships would now permit the bill to be read a second time, and send it to a select committee to be thoroughly sifted; and their lordships might reject the bill, if they saw occasion, on the third reading.

The Bishop of London: As the noble lord seemingly impugns my conduct in not giving a hearing to the gentlemen representing the Imperial Gas Company, I wish to explain that I was ready to hear them through my legal secretary. And having received from them a second letter in which they made the same statement as that made by the noble lord, I again referred them to my secretary, and I believe that an interview took place between them with reference to the 100 or 150 acres mentioned in the bill, and the localities in which they are to be situated. It would, no doubt, be a difficult thing to say the proportions in which the nuisance to be created, if your lordships sanction the passing of the measure, is to be distributed. It is, however, to be distributed between the east and west of London. The company at present hold 50 acres of land, and your lordships will perceive that there is a clause in the bill enabling them to increase their land by 100 acres. Now what is likely to be the effect of their doing so? We are, my lords, on account of our private interest, and perhaps we are also on public grounds, principally concerned with the west of London, because, unfortunately, the parish in which this company's works are situated in the east of London, affords a sort of example of what other parishes may be expected to come to in which they are authorized to carry on their works. My lords, I believe there was a time when Bow Common was a pleasant place; but I believe, also, that in consequence of the gas-works erected there, there is no place in her Majesty's dominions which is more avoided by persons who have sensitive organs than that locality now is; and if by the extension of the nuisance to the parishes of Chelsea and Fulham they are to be reduced to the condition of Bow Common, then I think not only all those who live in those parishes, but all London, will have reason to complain that the metropolis has been considerably and seriously injured. My lords, I cannot but think a question of great public importance is involved in this matter. I am given to understand that there are various ways in which gas can be manufactured. It can, as I am informed, be manufactured at no doubt a somewhat increased cost to the manufacturer, but with a great decrease of the nuisance that it causes to the different neighbourhoods in which the works are placed; and it is, as I have said, an important public question whether the metropolis must submit, in order that the profits of a company that has a monopoly may be increased, to have gas manufactured in that way in which it is most destructive to the health and to the property of the inhabitants. My lords, we are sought to be consoled by the assurance that the company do not intend to use their powers to the full extent, and that it is impossible for them to pollute the Thames without incurring a penalty for so doing. I have had experience of these impossibilities. They consist in this: that a very small penalty is to be levied for every time they violate the law; but we are all aware of this, that there are a vast number of violations of the law, which it is cheaper to make and to pay the penalty, than to avoid and save the penalty. I had the misfortune once to live close to a railway station, and, according to the law, the railway company were bound to burn coke instead of coal in their engines, but I had only at any time to look from my window to see that they were burning coal instead of coke, and were thus violating the law; and when they were threatened with legal proceedings they merely laughed at the threat, because it was cheaper that they should violate the law and pay the penalty, than obey the law and thus avoid the penalty. The proposition made by the bill before your lordships is ludicrous on this account, that all this is to be done for the benefit of a distant neighbourhood. The persons in the parish in which the works are to be carried on, are to receive no light and no advantage from the works. It is very true that there must be gas-works somewhere; but what I submit to your lordships is this, that they ought to be so regulated as to be prevented

from becoming public nuisances. I can testify that since this matter has been brought under my notice, all that I have been able to learn upon the subject only fortifies me in the opinion, that quite irrespective of the inconvenience to those who live in the neighbourhood, and also irrespective of the serious injury to property that will be occasioned by the construction and carrying on of the works, there are really public grounds that ought to induce your lordships to pause before you allow this bill to be read a second time. It will serve to show your lordships the strength of these great and powerful gas companies when I say that the Thames Embankment has been stopped by one of them, in consequence of the enormous claim for compensation which was made by it, and the expense of removing it would be so great. If the noble lord divides the House upon this motion, I shall certainly vote against the second reading of the bill.

Earl GRANVILLE said he did not see why the course usual in cases of private bills should be departed from in the present instance, namely, to send it to a select committee where all its clauses and details would undergo consideration, and where the clauses which might be thought objectionable could be either rejected or modified. If the select committee to whom it might be referred failed in its duty, and sent back the bill in such a state that it might be thought likely to inflict injury upon individuals, or upon the property of a locality, that would be the time to deal with it. He had certainly heard no argument sufficiently strong to induce him to agree to stopping the bill on the second reading. Let it first be thoroughly sifted by a select committee, and if it were still thought objectionable, let it be rejected on the third reading.

Earl GREY agreed with the noble earl who had just spoken that it was not usual in cases of this kind to withdraw a bill from the consideration of a select committee; at the same time he was bold to say he believed the bill under discussion involved considerations of too much public importance to be left to the decision of five members of their lordships House. The bill would come before the committee headed by the wealth of a great company, whereas the opposition to it could only come from private individuals who were aggrieved by it, and there would be no organization to bring the case of the public fully before the committee. It appeared to him to be quite clear that while on the one hand gas should certainly exist in the metropolis, on the other hand the manufacture of gas was a nuisance, and before it was allowed within the metropolis it ought to be proved that it could not be carried on at some considerable distance out of town, and the gas brought into it. The formation of gas-works in such a locality as that now proposed might prove to be so great a nuisance that he was strongly of opinion some public authority, the Board of Trade, the Metropolitan Board of Works, or some responsible authority appointed for the purpose by the Government, ought to consider the whole subject most carefully before authorizing them, or any other works of this description. The authority so appointed ought to place their conclusions before the select committee without imposing upon private individuals the burden of conducting a protracted opposition to the scheme of a powerful company. Some such course ought to be adopted in order that the truth might be arrived at, and that their lordships might have the means of judging what course should be taken. For his own part he had come to this conclusion, that with respect to works of this description select committees of both Houses of Parliament were most unsatisfactory tribunals, and that some better mode of instituting the necessary inquiries in cases of this kind might be and ought to be devised. According to the present practice it frequently happened that under the names of private bills questions of the greatest public importance were really discussed and decided by those committees. And particularly with regard to gas bills and water bills he was extremely jealous of the present system. With regard to gas and water companies, competition was impracticable. Any attempt at competition always ended in a struggle or in a compromise between the different companies at the expense of the public. It would, therefore, he thought, be sound policy to follow the course adopted in certain towns, and to leave the supply of gas and water in the hands of some public body acting on the part of the inhabitants of the district. In that manner they would have a security for the supply, and for the service being performed at the least expense to the public. He was strongly of opinion that the bill under consideration ought not to be allowed to pass until it had been thoroughly investigated in all its bearings by the Board of Works, or by some competent authority appointed for the purpose by her Majesty's Government.

Lord REDESDALE said he should be sorry if a different course were pursued in reference to this bill from that which was followed in other similar cases. The question was, no doubt, a very difficult one as regarded the localities in which gas-works should be erected, but it should be remembered that in the present case the company had works on the site on which they now proposed to construct additional works, and had carried on the manufacture of gas there for the last 35 years. He confessed, after what had been said by the right reverend prelate (the Bishop of London) as to its being possible to manufacture gas in a much less offensive way than at present, that the subject was worthy of receiving the fullest consideration, with a view to see whether that great end might not be attained, and also whether this evil might not be mitigated, but if so the object ought to be attained by a public Act similar to the Act which was introduced by his noble friend behind him (the Earl of Derby) for restraining the nuisance of alkali-works, and which had operated with so much advantage to the public. It would be quite justifiable that Parliament should step in and say, "You must abate this nuisance," but that was purely a question which would be properly considered by a select committee. With reference to the present case, it was scarcely fair to say simply that the company wanted power to erect works on 100 acres of land. The company had already three establishments in the metropolis for the manufacture of gas, and they had 13 or 14 acres of land at Fulham on which they could erect works without additional powers from Parliament, and the consequence was that they could not tell the company that they should give up the power to manufacture gas altogether. It would, he thought, be much better that the opponents of the bill should go before the select committee, and get such clauses inserted in the bill as might be considered necessary for the protection of the neighbourhood. That certainly appeared to be a much better mode of dealing with the subject than to reject the bill on the second reading.

Lord RAVENSWORTH submitted that a necessity for a revision of the law had been shown to exist, and he trusted that until that revision had taken place the accumulation of works sought to be authorized by the bill would not receive the sanction of their lordships.

Lord LYTTELTON said that, having been strongly appealed to from a highly respectable quarter to oppose the bill, he should be sorry to see it passed in its present shape. He thought, however, that it should be allowed to go before a select committee in order that its details might be thoroughly investigated.

Their lordships then divided on the motion that the bill be read a second time.

Content	43
Not-content	46
Majority against the second reading	3

The bill was accordingly lost.

DIVISION LIST.

CONTENTS.

Cambridge, Duke of.	Boyle, Lord. (*Earl of Cork and Orrery.*)
Westbury, Lord. (*Lord Chancellor.*)	Camoys, Lord.
Cleveland, Duke of.	Chelmsford, Lord.
Somerset, Duke of.	Clandeboye, Lord. (*Lord Dufferin and Clandeboye.*)
Ailesbury, Marquis of.	Cranworth, Lord.
Belmore, Earl.	Ebury, Lord.
Caithness, Earl of.	Foley, Lord.
Carnarvon, Earl of.	Lyttelton, Lord.
Chichester, Earl of.	Lyveden, Lord.
De Grey, Earl.	Oxenfoord, Lord. (*Earl of Stair.*)
Granville, Earl.	Ponsonby, Lord. (*Earl of Bessborough.*)
Grey, Earl.	Portman, Lord. [TELLER.]
Harrowby, Earl of.	Redesdale, Lord.
Nelson, Earl.	Rivers, Lord.
St. German's, Earl.	Saltersford, Lord. (*Earl of Courtown.*)
Shaftesbury, Earl of.	Seymour, Lord. (*Earl St. Maur.*)
Spencer, Earl.	Stanley of Alderley, Lord.
Stanhope, Earl.	Taunton, Lord. [TELLER.]
Eversley, Viscount.	Truro, Lord.
Sydney, Viscount.	
Aveland, Lord.	
Belper, Lord.	
Bolton, Lord.	

NOT-CONTENTS.

Dublin, Archbishop of.	Ripon, Bishop of.
Westmeath, Marquis of.	Winchester, Bishop of.
Amherst, Earl	Castlemaine, Lord.
Bandon, Earl of.	Clements, Lord. (*Earl of Leitrim.*)
Cardigan, Earl of.	Colville of Culross, Lord.
Dartmouth, Earl of.	Denman, Lord.
Hillsborough, Earl of. (*Marquis of Downshire.*)	Digby, Lord.
	Dinevor, Lord.
Home, Earl.	Dunmore, Lord. (*Earl of Dunmore.*)
Mayo, Earl of.	Dunsany, Lord.
Powis, Earl of.	Feversham, Lord.
Romney, Earl of.	Houghton, Lord.
Verulam, Earl of.	Inchiquin, Lord.
Clancarty, Viscount. (*Earl of Clancarty.*)	Lovel and Holland, Lord. (*Earl of Egmont.*)
Hawarden, Viscount.	Polwarth, Lord.
Lifford, Viscount.	Raglan, Lord.
Melville, Viscount. [TELLER.]	Ravensworth, Lord. [TELLER.]
Strathallan, Viscount.	Rollo, Lord.
Bangor, Bishop of.	Sherborne, Lord.
Carlisle, Bishop of	Silchester, Lord. (*Earl of Longford.*)
Chichester, Bishop of.	Somerhill, Lord. (*Marquis of Clanricarde.*)
Gloucester and Bristol, Bishop of.	Wentworth, Lord.
London, Bishop of.	Wynford, Lord.
Oxford, Bishop of.	

The KIDDERMINSTER, STOURPORT, and BEWDLEY WATER Bill was referred to a Select Committee, consisting of the Earl of Lucan (chairman) the Earl of Bandon, Earl Manvers, Lord Seaton, and Lord Belper, who will sit on Monday, May 29, at eleven o'clock.

HOUSE OF COMMONS.

MONDAY, MAY 15.

The BATH GAS; BRISTOL WATER; and WEST WORTHING IMPROVEMENT Bills, were agreed to, as amended by the Lords.

The EXMOUTH GAS Bill was read a third time, and passed.

The RIPON LOCAL BOARD and the TORQUAY GAS Bills, as amended, were considered, and ordered to be read a third time.

TUESDAY, MAY 16.

The SOUTHAMPTON GAS and the WEST BROMWICH IMPROVEMENT Bills were read a third time, and passed.

The CRAYS GAS Bill, as amended, was considered. To be read a third time.

WEDNESDAY, MAY 17.

The CRYSTAL PALACE DISTRICT GAS Bill was agreed to, as amended by the Lords.

THURSDAY, MAY 18.

The ST. ALBANS WATER; TYLDESLEY-WITH-SHAKERLEY LOCAL BOARD; CHESTERFIELD WATER AND GAS; and WINCHESTER WATER AND GAS Bills, were agreed to, as amended by the Lords.

The RIPON LOCAL BOARD and the TORQUAY GAS Bills were read a third time, and passed.

The TUNBRIDGE WELLS WATER Bill was re-committed to the former committee.

The LOCAL GOVERNMENT SUPPLEMENTAL (No. 3) Bill was reported.

FRIDAY, MAY 19.

The PORT GLASGOW POLICE AND WATER and the GREENOCK POLICE AND IMPROVEMENT Bills were reported.

The RUNCORN, WESTON, AND HALTON WATER Bill was agreed to, as amended by the Lords.

The CRAYS GAS Bill was read a third time, and passed.

The BELFAST WATER and the MANCHESTER CORPORATION WATER Bills, as amended, were considered. To be read a third time.

MONDAY, MAY 22.

The RASTRICK GAS Bill was agreed to, as amended by the Lords.

The SOUTHPORT IMPROVEMENT Bill, as amended, was considered. To be read a third time.

The GOMERSAL GAS Bill was read a second time, and committed.

The TUNBRIDGE WELLS WATER (*re-committed*) Bill was reported.

TUESDAY, MAY 23.

The BIRSTAL GAS; the MANCHESTER CORPORATION WATER; and the DRIGHLINGTON AND GILDERSOME GAS Bills were read a third time, and passed.

The LIVERPOOL UNITED GAS Bill was reported.

THURSDAY, MAY 25.

The AYR WATER Bill was reported, with amendments.

The HIGHBRIDGE MARKETS AND GAS Bill was reported, without amendment. To be read a third time.

The LITTLEBOROUGH GAS; BRIERLY HILL GAS; and PRESTON GAS Bills, were agreed to, as amended by the Lords.

The SOUTHPORT IMPROVEMENT Bill and the BELFAST WATER Bill were read a third time, and passed.

FRIDAY, MAY 26.

The GOSPORT GAS and the LLANELLY LOCAL BOARD OF HEALTH Bills were agreed to, as amended by the Lords.

GAS (METROPOLIS) ACT, 1860.—A petition was presented from C. Coleing and others, praying for alteration.

HOUSE OF LORDS.

(Before Earl PERCY, *Sir* JAMES MATHESON, *Mr.* GÖSCHEN, *and Mr.* GREENWOOD.)

WEDNESDAY, MAY 17.

LOCAL GOVERNMENT SUPPLEMENTAL (No. 3) BILL, 1865.

STROUD PROVISIONAL ORDER.

Mr. CRIPPS and Mr. H. JAMES appeared for the Stroud Local Board of Health, who sought by this bill the confirmation of a provisional order made by the Home Secretary, Sir George Grey, for extending their borrowing powers. The bill was opposed on petition by the owners and occupiers of property, and ratepayers and consumers of gas within the limits of the district of the Stroud Local Board of Health, and by others without the said district, but within the parliamentary borough of Stroud, in the county of Gloucester, and by holders of securities for moneys charged on the rates within such district, and by the Stroud Gaslight and Coke Company. Mr. HOPE SCOTT, Q.C., Mr. PHINN, Q.C., and Mr. WINTERBOTHAM, appeared for the petitioners.

Mr. CRIPPS said he had the honour to appear on behalf of the Stroud Local Board, at whose instance and on whose behalf the provisional order had been made, of which the confirmation by Parliament was now asked. The first recitals in that order itself led up pretty well to the existing state of things at Stroud. They stated that—

Whereas the Public Health Act, 1848, has been duly applied to the area comprised within the boundaries of the town of Stroud in the county of Gloucester, as defined in the second section of the *Local Act of 6 Geo. 4. c. 6.*; and, under the provisions of the Public Health Supplemental Act, 1857, 20 Vict. cap. 3., the commissioners for the time being acting in execution of the said Local Act "for paving, lighting, watching, cleansing, regulating, and improving the town of Stroud, in the county of Gloucester," were appointed the Local Board of Health, under the said Public Health Act, subject to the provisions in the said last-mentioned Act contained as to the election of members.

And whereas the powers, authorities, and duties of the said commissioners ceased from and after the passing of the aforesaid Public Health Supplemental Act, 1857, and were transferred to the said Local Board of Health, to be exercised as if they had been granted or imposed by the said Public Health Act; and all property and estate of the Commissioners acting in the execution of the said Local Act were also transferred to the said Local Board of Health, and all debts, moneys, and securities for money contracted or payable, or to become payable by such commissioners, were thenceforth to be satisfied by the said Local Board.

Those recitals, therefore, shortly embodied these facts, that there were by an old Act commissioners for the town of Stroud who had various duties committed to them, and various powers conferred upon them which they might or might not exercise. Amongst the powers so conferred were the establishment of gas-works, and the lighting of the town with gas. That appeared from the clauses of the Act by which the commissioners were incorporated in the year 1825. It was not necessary for the present purpose further to allude to the commencement of legislation in the town of Stroud than to point out that under that Act, among other powers, the commissioners had this power of erecting gas-works and of lighting the town. The other matter embodied in this part of the recitals was that a Local Board of Health had been established in Stroud, and that under provisional orders already made and confirmed, the powers which the old commissioners possessed under the original Act had been transferred to, and were now vested in, the said local board, who as the successors of the commissioners might if they thought fit erect gas-works for the purpose of lighting the town. His lordship no doubt knew how it was that it became necessary for the provisional order which the local board had obtained to extend their borrowing powers to receive the sanction of Parliament. The local board in order to carry out these works would, of course, require to raise money. If they had not already raised an amount of money which was equal to one year's assessable value of the property in the town of Stroud, there would have been no necessity for any application to Parliament; they could have raised the amount under the authority of the Secretary of State. But by the provisions of the Local Government Act it was provided, that if money were required for carrying out works of a permanent nature, after the amount of one year's assessable value of the property had been borrowed, the provisional order made by the Secretary of State must receive the confirmation of the Legislature, before it became valid. Inasmuch, therefore, as in the present case the local board of Stroud had already, for purposes connected with sanitary matters, raised as much money as was equivalent to one year's assessable value of the property in the town, the order which they had obtained was of no effect till it had been sanctioned by Parliament. It was on this account that the bill was now before the committee, and this explained pretty clearly what the real question to be decided by them was. The question was not whether the local board had power to erect gas-works—that was not disputed—nor whether they had power to do so out of the rates; but whether they, having already reached the limit of their borrowing powers upon the security of those rates, should be allowed to raise a further sum of money for this purpose. On the present occasion the local board were opposed—he thought he might say substantially—by one party, the gas company; though others were alluded to in the petition in connexion with them. Since the powers he had mentioned were conferred upon the commissioners for lighting the town of Stroud, a gas company had been established there under contract with the existing commissioners, in a way to which he would refer presently. This gas company thought that if power were given to the local board to borrow additional money, it would facilitate that to which the gas company might object—viz., the establishment of works in competition with their own; and they very naturally preferred that they should have the monopoly of the supply in the town, and a considerable surrounding district, and that no one else should be allowed to come in to compete with them in the matter. Accordingly they petitioned against the bill, and in their petition they were associated with a portion of the ratepayers. One was not surprised at that, because it would hardly be expected that in a question of this sort a whole town would be unanimous, particularly a town like Stroud, because among the shareholders of the old gas company there would be sure to be a number of friends and dependents of the shareholders who would be in their favour when a subject of this sort was mooted. The local board were, therefore, opposed by a petition purporting to be from the ratepayers of the town and from the gas company, but substantially, as he said, it was the petition of the gas company. The gas company were established in Stroud under these circumstances. Although under the Act of 1825 the commissioners possessed powers to light the town, they had never exercised those powers. After a time, certain individuals came forward and undertook to do so, and they at once entered into negotiations with the commissioners with reference to the public lights, which, of course, were entirely within their control. The gas company were not then incorporated; they were a party of speculators who had come into the town; but the commissioners dealt with them, and the result of their negotiations was an agreement for a period of 21 years, during which they said if you put down gas-pipes and light the houses of the inhabitants you shall have the lighting of the public lamps, provided you fulfil such and such conditions during that time. That contract had now expired, and there was, except by arrangement from year to year, no binding agreement at all between the commissioners, or rather the Local Board of Health, who were their successors, and the existing gas company.

The CHAIRMAN inquired the date of the original establishment of the gas company.

Mr. CRIPPS said the commissioners were appointed originally in 1825, and their first contract was made with the gas company in 1833. There were from time to time modifications of the contract, and probably it would be necessary to mention these in the evidence; but he proposed, in the first instance, merely to give to the committee a general outline of the case, leaving the details to be filled up by the witnesses who would be called before them. There was, however, no dispute on this point, that there were now no contracts at all existing except as they might be renewed by the Local Board of Health from time to time. Matters went on in the way he had described until the year 1863, at which period there seemed to be a desire prevailing in the town of Stroud that the Local Board of Health should undertake the management of the gas-works, and manufacture gas for the consumers. They accordingly applied to the Secretary of State for the purpose of obtaining a provisional order authorizing them to raise the money required. The course of procedure in such cases, and the course therefore adopted in this case, was that the Government sent down an inspector to make inquiry and investigation upon the spot, because there were various matters relating to details of this kind, which could be much better inquired into there than they could be in any other way. The commissioner appointed by the Government (Mr. Morgan) went to Stroud, and the inquiry took place on the 16th March, 1864. Upon that occasion the gas company opposed the purposes of the local board, and the purposes for which the commissioner had been sent down. The matter was very fully inquired into, as appeared from a document which he (Mr. Cripps) held in his hand, which was a report of all the proceedings that took place, and of the examination of the witnesses before the commissioner. The result of the inquiry was that the commissioner reported to the Secretary of State that the provisional order ought to be made, and, acting upon that report, the Secretary of State made the order. That was in the year 1864. In the meantime the Stroud Gas Company, who up to that period had had no Act of Parliament, taking alarm at the proceedings that were going on, brought in a bill by which they sought to obtain incorporation. At the time the bill was brought in, the provisional order which the committee were now asked to confirm had been made, and it was proposed to have it inserted in the Local Government Act of last year. For some reason or other, however, it was thought that there were several matters which would be more or less opposed, and the order was withdrawn for that time from the bill of 1864, and now came before the committee upon the bill of this year for confirmation. He mentioned it now for the purpose of showing what had taken place by the gas company in the meantime—viz., that they had sought for and obtained an Act of Incorporation, conferring certain powers and privileges upon them. The Local Board of Health did not think it was their business to appear to oppose that bill; they had already given the fullest notice to the gas company that whatever they might do it was intended at Stroud that the supply of gas should in future be in the hands of the local board, and, indeed, there was a question whether it would be a proper application of the local rates to expend them upon parliamentary opposition to the gas company; but the company had the fullest notice that the provisional order which had been obtained the local board would endeavour to get confirmed. The gas company incorporated by the Act of last session were their opponents on the present occasion, and he might mention that there was one matter connected with that company which was felt to be a grievance in the town of Stroud. He did not know that it would be necessary before the committee to go into details of the proceedings of the company at various times heretofore; it would be sufficient to mention that they had power to light not only the town of Stroud, but also the outlying districts to a considerable distance around the town. Of course, gas being manufactured as it was at Stroud in a central position, could only be supplied to places at a great distance at a considerably greater cost than to persons residing immediately adjacent to the gas-works. The map exhibited showed the position of the company's works, the limits of the Board of Health district, and the area over which the public lighting extended. The gas-works were established in the town of Stroud, but the company lighted not only the town itself, but also the distant places of Minchinhampton, Nailsworth, Stonehouse, and other places at a considerable distance from the works. The inhabitants of Stroud proper felt that so long as the company did that they (the inhabitants) were called upon to pay a larger sum for gas than they would have to pay if they manufactured it themselves; because, obviously, gas could not be supplied to a distance like Stonehouse, Minchinhampton, &c., except at a greatly increased pressure, and consequently greater leakage, rendering the cost much higher than if the supply were confined within narrower limits.

The CHAIRMAN asked how far Minchinhampton was from the town of Stroud.

Mr. CRIPPS said, taking the course of the company's mains, it was six miles, or, as the crow flies, four miles. This was, as he had stated, one reason why the inhabitants of Stroud desired to have the supply of gas in their own hands. But quite independently of a reason of this kind, which was very strong (for the inhabitants felt they ought not to be taxed for the benefit of places which were at a considerable distance from Stroud), they felt that the Local Board of Health were the proper parties to supply gas. In point of fact, they desired that the local board should do at Stroud as was done in many other places—supply the gas to the ratepayers, who, being themselves the consumers of gas, were deeply interested in the question. This desire to have gas supplied by the local board was communicated to that body in 1863, by a memorial signed by a very large number of persons. It was as follows:—"We, the undersigned, ratepayers of the town, respect-

fully but earnestly impress upon your attention the following very important matter. We are much dissatisfied with the present supply of gas to the town and factories. It is bad in quality, often deficient in quantity, and too high in price. Even if the quality were good, we are of opinion that the supply of gas is like the supply of water, a work proper to be undertaken by the town authorities, the profits accruing from such works benefiting the ratepayers and consumers. The quantity of gas already consumed in Stroud is sufficient to ensure a good return for the necessary outlay, and we are assured that a regular supply of good gas at a moderate price would immediately cause a large increase in the demand for it. We, therefore, earnestly impress up your serious consideration the desirability of at once putting in force the powers given you by Act of Parliament for supplying the town with gas." That memorial having been presented, the Local Board of Health, of course, took the matter into their serious consideration, as it was their duty to do with reference to their constituents. Upon an investigation they were satisfied that the facts stated by the memorialists were correct, and that they could supply the inhabitants with good gas at a lower rate, and in a more convenient manner, than they were being supplied with it. Accordingly the board came to an almost unanimous resolution on the subject. It was to be supposed that the Local Board of Health would contain among its members some parties who were interested in the old company, but with the exception of one or two persons of that description, the resolution of the board was unanimous in desiring to carry out the objects of that memorial. One very material point to be considered by them was the amount of the existing debt, and how far it would be right to add to that debt. Upon due consideration, it was found that, although the existing debt exceeded the annual assessable value of the property in Stroud, it only just exceeded it, the debt being £17,000, and the yearly assessable value £16,517. But then they found this in addition, that part of this money had been borrowed with reference to the water supply of Stroud, which water supply was in fact paying itself, and something over; that, in addition to its being no actual cost, the interest on the money borrowed was also paid by it, and an amount set apart annually out of the revenue towards a sinking-fund. They, therefore, thought at that time, as they still continued to think, that this was a case in which they were perfectly justified in asking Parliament to allow them to increase the amount of their debt by the sum mentioned in the provisional order. That amount was £5400, of which sum £5000 would be applied exclusively, according to estimates which had been prepared, to the erection of gas-works, and the purchase of the necessary appliances for the supply of gas, the remaining £400 being required for some extension of the water-works. The question, therefore, came before the committee in this way—here was a town in which the annual assessable value was £16,500; there was already borrowed and owing £17,000; was there anything unreasonable in the local board asking Parliament to allow them to raise an additional £5400 for a purpose which they had already full power to execute? There could be no question that if at the present moment the ratepayers were willing to have the amount raised from their rates at once, and that the burden should be thrown upon the parties who were now ratepayers, no one could oppose the Board of Health in erecting such works and supplying the town with gas. The power was created by the original Act of 1825, which power was transferred from the commissioners to the local board, who were now in full existence. The local board felt that the gas company were out of court in reference to their present opposition, because they were not now asking for power to supply the town with gas for the first time—they already possessed the power—but all they asked was that they might be enabled to exercise that power beneficially and usefully to the ratepayers, without undue pressure upon them by raising this amount, which, as compared with the assessable value, was but a small amount, and spreading its repayment over the next 50 years. He did not propose to say anything further in opening the case, until he heard more with reference to the opposition. It seemed to him that the proposal of the local board was a most reasonable one. It had been fully considered, first, by the parties who sent the memorial to the local board, next, by the local board themselves, and then by the commissioner sent down by Government to inquire into the matter. It now only remained that it should receive the formal sanction of Parliament, because the addition of the amount required for the purpose of carrying it out exceeded the annual assessable value of the property in the town. Two petitions had been presented against the proposition, one of which was from the ratepayers of Stroud, some of whom, no doubt, would be called to state that they did not require the alteration which the provisional order would, if carried out, effect. But he might state to the committee that, since the local board had determined to apply to Parliament there had been an election of members to serve on the local board. At that election, he was told, "gas" was the cry, and that gas carried the question altogether, so that the new members of the board were elected by the ratepayers, after full knowledge that this question had been under consideration, and that an application was to be made to Parliament for the confirmation of the provisional order, the result of the election being that the members who represented the gas interest were elected by a considerable majority. There could be no question that the Local Board of Health had only done their duty to their constituents, and the very fact of their being now before the committee with this bill proved that there must be a very considerable majority of the ratepayers of Stroud, who desired to have the provisional order confirmed in the way proposed. He would briefly call attention to the petitions, to show that although they might purport to be the petitions of owners of property, &c., in the town, they were in fact the petitions of the gas company and of their friends in Stroud; the two petitions being substantially one, the only difference being in the signatures.

Mr. PHINN said he thought it fair at once to tell his learned friend, that he should insist very much upon the fact, that the holders of securities for £14,000 out of the £17,000 already raised by the Local Board of Health, were petitioners against the present bill.

Mr. CRIPPS said he had no doubt it was so, but the committee would hear who these parties were, and how far they were connected with the gas company. The petition, after stating the purpose of the present application to Parliament, began at once upon the question of the supply by the existing gas company. It was a gas petition throughout. The reasons given by the petitioners, who called themselves the owners and occupiers of property, against the bill were these :—"1. Because further gas-works are, in the opinion of your petitioners, unnecessary; and if hereafter found desirable should, as your petitioners submit, be the subject of private speculation." That was the first reason, and it obviously was the gas company's reason. The company thought very naturally that further gas-works were not necessary, or, if not, they would evidently rather have a new undertaking in the hands of private speculators than in the hands of the local board of the town. The second reason was this: "Because the establishment of a second company, within the district already lighted by the Stroud Gaslight and Coke Company, is calculated to retard rather than further a permanent reduction in price, as experience has abundantly shown in other cases." That was also a gas company's allegation. "3. Because the erection of small gas-works to light the Board of Health district, in competition with a large and long established company, with a large consumption, not only within but outside the district, cannot, in your petitioners opinion, prove a successful speculation, but must prove a serious loss and consequent tax upon your petitioners property, which is already heavily taxed." Here again the deprecation of gas-works in competition with them was of course the gas company's allegation. "4. Because any increase of the present large rates levied upon the property of your petitioners would most injuriously affect the same." "5. Because, if moneys are borrowed, they should be applied for the further sanitary improvement of the district, which is much wanted." This was a matter which the local board had never heard of, nor was it ever suggested until it was alleged by the gas company. "6. Because great public inconvenience would be occasioned if authority were granted to lay down, repair, and alter, from time to time, duplicate sets of pipes along and under the streets and roads of the district, many of which are very narrow." "7. Because many of your petitioners are men of small means, owning and occupying cottages rated to the Local Board of Health, who, while liable to all the consequences of failure as contributors to the rates, do not use gas, and could not, therefore, be benefited, even if the price of gas were reduced by the establishment of a new body for the supply of it." The rest of the petition was avowedly the petition of the gas company. But, before he came to that, there was one allegation by those who were called the "consumers of gas." It ran thus:—"That your petitioners, the consumers of gas, pray and protest against the said provisional order and confirmation of the same, for the following reasons beyond and besides those hereinbefore already generally stated:—"1. Because, being sufficiently and properly lighted by the Stroud Gaslight and Coke Company, a competition within a part only of the company's district must tend, if it reduced the price of gas within the district, to postpone the reduction in price by the existing company outside such district." Now this was exactly what the local board thought was very proper; but then they felt that those persons who were outside the district ought not to expect to be supplied at the same price as those within the district could be supplied at. The petition proceeded to state:—"2. Because your petitioners using the streets and roads within the district, many of which are very narrow, will be greatly inconvenienced if power be given to lay, take up, and relay duplicate sets of pipes throughout the district." This objection, of course, amounted to nothing, because the inconvenience, if any such should arise, would only be for a short time. After this came a number of allegations by the Stroud Gaslight and Coke Company themselves. These were the issues which he presumed they intended to raise, and therefore it would be very convenient to read them at the present moment. Although contained in the same petition, the committee would see at once the reason of their introduction—"That your petitioners, the Stroud Gaslight and Coke Company, pray and protest against the confirmation of the said provisional order, on the following grounds:—1. That the company, or their predecessors, in title have lighted the town of Stroud for the last 30 years and upwards; first as a private co-partnership, subsequently as a joint-stock company incorporated under the Joint-Stock Companies Act, 1856, and since as a joint-stock company incorporated by special Act of Parliament, granted so lately as the last session of Parliament.—2. That the Stroud Gaslight and Coke Company was first called into existence for the purpose of lighting the town of Stroud, by the commissioners acting under the Town Improvement Act, whose powers, authorities, and interests are now represented by the Stroud Local Board, the promoters of the present bill; and the company did in fact lay down, and have since maintained a considerable length of pipe in the upper part of the town, almost for the sole purpose of lighting the public lamps, and from which they have never derived any adequate profit." He was told that it would be proved that this allegation on the part of the petitioners was a mistake, that they were not called into existence by any means by the commissioners acting under the Stroud Improvement Act. They came there as a body of adventurers, and went to the commissioners, who entered into a contract with them, which contract, now expired, the company had had the benefit of. "3. That the company have upwards of 20 miles of pipe laid throughout their lighting district, and throughout the Board of Health district, and have continually extended, and are prepared further to extend, their mains to meet the wants of public and private consumers, when and as brought under their notice.—"4. That by their Act of Parliament, granted last session, they are compelled under heavy penalties to manufacture 13-candle gas at a maximum price of 5s., and are placed under the provisions of the 'Gas-Works Clauses Act' as to reduction of price and otherwise." He had already told the committee that the local board did not oppose the company on that occasion. The Act they obtained was entirely of their own seeking, and if in anything it was more stringent than they could desire, they could not now complain that the local board had any hand in imposing such obligations upon them. "5. That before the bill of the company went into committee in Parliament, the solicitor of the company handed to the clerk to the said local board a print of their bill, and offered to consider any clauses that the board deemed it desirable should be introduced therein with reference to the public lighting; but though the company repeatedly made such offer, the local board declined to make any suggestions." This was of course to be expected, because at that time the Local Board of Health had already determined to erect gas-works of their own, and to light their own lamps. "6. That the company, since the passing of their Act, have voluntarily reduced the price of gas to private consumers from 5s. to 4s. 6d. per 1000 cubic feet, while they have at the same time fulfilled the conditions of their Act as to illuminating power." No doubt they might have fulfilled the conditions of their Act as to illuminating power, and that they had as stated reduced the price from 5s, which they were charging last year, to 4s. 6d., which they are charging now. "7. That since the company obtained their Act, they have renewed the yearly contract with the local board for lighting the public lamps, voluntarily agreeing to light on several nights each month of lighting beyond the stipulations of the previous contracts, and have ever since so lighted, thus giving an extra supply of gas during each lighting season, and have repeatedly offered to the local board to light the public lamps at a price to be fixed by the average of all the towns within 20 miles, regard being had to the price of gas-making coal, and of the residuum, and in any other way to meet them with liberality on the subject of public lighting, but all such offers have been uniformly declined by the local board." "8. That on the faith of their Act of last session, the company have called up further capital and have improved their works, and have entered into contracts for additional gasholding room to the extent of 340,000 cubic feet, at a cost of upwards of £7000." That it was quite possible they had done, but it must be remembered they had done it with the fullest possible notice of the intentions of the local board in this matter. Then

they stated :—"9. That the company are supplying a good article at a fair price, and have acted with liberality towards the public, and have fulfilled all the obligations imposed upon them by Parliament." "10. That a public local board, especially one altogether unrestricted as to the illuminating power of their gas, ought not to be allowed to compete by means of public funds, with a company of private subscribers who have only their own money to deal with." "11. That the sum proposed to be borrowed by the local board is insufficient to carry out effectually and properly the lighting of the district, and the local board have no available site for the erection of their works." This did not come very well from the gas company, who would be benefited to the greatest possible extent if the local board were not able to carry out their scheme. "12. That the local board are by no means unanimous in desiring the confirmation of the provisional order; nor do the majority of the owners of property in the district desire it." He (Mr. Cripps) did not know what "the owners of property in the district" might mean, nor what "the district" referred to was. "13. That the facts of the case are no either fully or correctly stated in the provisional order, sought to be confirmed by the said bill as regards Stroud." He had read this petition through, not as part of his case, but for the sake of putting the committee in possession of the nature of the intended opposition. He would only say, in conclusion, that the question before them was solely this: Is there anything unreasonable in allowing the Local Board of Health to borrow this small additional sum of money? That was all that was referred to the committee, and he trusted that they would have no difficulty, after hearing the evidence, in confirming the provisional order.

Mr. *Edwin Witchell*, examined by Mr. CRIPPS.

I am clerk to the Stroud Local Board of Health, and was clerk to the old commissioners before their powers was transferred to that board in 1857. The district of Stroud under the Public Health Act, is the same as the district under the Lighting and Paving Act. That district is comprised within two segments of a circle—the parish of Painswick on the one side and the parish of Rodborough on the other, cutting the district into two. The district comprises only so much of the parish of Stroud as is situate within a mile of the parish church, and the town is entirely on one side of the division caused by the adjoining parishes of Painswick and Rodborough. The coloured portions of the map represent the district of the local board, the district lighted by the gas company, and a portion of ground purchased by the board for the purpose of sewerage works. There is an open space between there and the canal upon which they proposed to erect their gas-works along side of the present works. The annual assessable value of the whole district is £16,517. 14s. 3d., as appears from the last rate. The population of the district can only be estimated, inasmuch as it is part only of the parish. I estimate it at 8000. After the Public Health Act was applied to Stroud, the local board immediately formed a sub-district for lighting purposes, and they passed a resolution to confine the area of that sub-district to a distance of 100 yards beyond the furthest lamp-post in every direction. That is the district which is now charged with the expense of the public lamps. There are in that district 952 houses, 8 mills, breweries, and factories, and 33 other buildings, such as malt-houses, workshops, stables, and the like, which are separately assessed. There is also the railway station. The rateable value of this inner district is £11,294, as appears from the last rate made for lighting purposes. There are 399 ratings, which represent each a gross rateable value of £10 a year. The length of the streets in this district is 4356 yards. The site of the proposed works is 880 yards from the nearest street. When the Public Health Act was first applied, in 1857, we took upon us the liabilities of the old commissioners. There was then a debt of £3000 charged upon the rates, of which only £100 has been since paid off. Subsequently to that a sum of £7500 was raised for sewerage works, of which amount £500 has been repaid. In addition to that, the local board purchased the water-works of a then existing company, which works they have improved so as to extend the supply. The purchase-money of those works was £6000. They were very old works, and required an immediate outlay to render them available for the public service. For that purpose the board raised £1600. They still find that they cannot complete the necessary extensions without some further assistance, and they now propose to obtain powers to borrow £400, which will complete the works. They have repaid £300 of the money borrowed, and there is a further sum of £360 in the treasurer's hands waiting for the day to arrive when it becomes due. The present total debt is £17,140, less this £360. The money borrowed for the water-works is not a material burden on the rates; it is very slight indeed, and soon will be no burden at all, inasmuch as the income from the water-rents pays the whole of the interest on the purchase-money, and other moneys borrowed, as well as all the cost of management, leaving a sum of about £20 a year as a sinking-fund for the redemption The income from these rents is increasing rapidly, and will within a very few years, I think, enable the board to pay the sinking-fund without any application of the rates at all. The town is very well supplied with water, and there is sufficient drainage. There are still some minor works scarcely worth mentioning to be done, and which the board are executing from time to time I am not personally conversant with the circumstances under which the present gas company came to Stroud, but from the records of the commissioners in my possession I am familiar with them. It appears that in 1832 a Mr. Stears applied to the commissioners on the subject of the public lighting, and the result of negotiations was that the commissioners entered into a contract with him, by which, in consideration of his laying down pipes in the streets, and undertaking to light a certain number of public lamps, the commissioners consented to his breaking up the roads and supplying the houses with gas. The contract was for 21 years, and Mr. Stears bound himself to light the lamps at £2. 18s. each per annum. The lighting was to extend over eight months in the year, certain moonlight nights excepted. The streets were broken up, and the mains laid, but the commissioners at that time did not think proper to have any public lighting at all. Two years afterwards, when new commissioners were elected, the question came up again. and it was ultimately agreed to have the public lamps lighted with gas at £2 each per annum. There was a clause in the contract by which the commissioners reserved to themselves the power of lighting or not lighting, as they thought proper. I believe Mr. Stears made his arrangements with the commissioners intending to form a company; at all events a company was formed at the time, and the benefit of the contract to Mr. Stears passed to the company. After it was made over to the company there were various bargains made between them and the commissioners. The first contract was for seven years. That expired in 1842, and the company then refused to continue to light the lamps at £2 each per annum. They arranged to light them for one year at £2. 8s each, and at the end of the year there was a further advance to £2. 10s. They continued the lighting at that price down to 1855, when it was thought desirable to extend the lighting during the month of May—another month a year - and the price was fixed at £2. 16s. per annum, at which rate the lamps are still lighted. Since the proceedings to obtain the provisional order were begun the company have generously made us a present of all the lighting during that time. The contract is now only from year to year. It is publicly known that the company started with a capital of £6000. When they came to Parliament last year their capital was fixed at £18,000. People in Stroud suppose that the increase of their capital was made up from the profits of their gas in the meantime, and that is one reason why they feel themselves aggrieved.

Mr. PHINN said he did not intend to interrupt the witness, even when stating that which he only knew by hearsay, provided that what he stated was correct; but in this matter his statement was perfectly incorrect.

Examination continued: In 1863 the momorial was presented to the Local Board of Health, which has been read, which memorial was signed by a large majority of the gas consumers in the town, and by a few consumers out of the town, as well as by persons who were not consumers at all. There was a meeting of the board called to consider the memorial. The board consists of 18 members, of whom 11 were present, 5 of the absent members being shareholders in the gas company. The result of the meeting was an unanimous vote that gas-works should be established, and a committee was appointed to institute the necessary proceedings, with a view to obtain a provisional order for a loan from the Secretary of State. A petition was presented for an inquiry, and a commissioner was sent down to take evidence at Stroud upon the subject. A public meeting was called in the town-hall for the purpose, and all parties were very ably represented. I attended on behalf of the Board of Health, and a gentleman attended on the part of the ratepayers. The gas company was represented by Mr. Winterbotham, their solicitor. There were four other legal gentlemen, who said they attended on behalf of owners of property, but did not give their names. They took the same line as Mr. Winterbotham did. The following report, which led to the granting of the provisional order, was made by the commissioner:—

LOCAL GOVERNMENT ACT, 1858.

STROUD, GLOUCESTER.

Report on an inquiry in pursuance of a petition from the Local Board of Health for the district of Stroud, in the county of Gloucester, to obtain a provisional order for extending the borrowing powers of the said board.

London, May 2nd, 1864.

To the Right Honourable Sir George Grey, G.C.B., M.P., Her Majesty's Principal Secretary of State for Home Affairs, &c.

Sir,—After due notice, given as the Act directs, I attended at one o'clock in the afternoon of the 16th day of March, 1864, at the *town-hall, Stroud*, and did hear all persons desirous of being heard on the subject of this inquiry.

There were 1100 ratepayers within the district of the Local Board of Health, 300 of whom have signed this petition, representing a rateable amount of property equal to £5800. This sum includes rateable property of members of the local board who did not sign the petition, though assenting to it.

The resolution to present this petition was passed unanimously by the Local Board of Health.

The object for which the memorialists pray for an extension of their borrowing powers are, for the construction of gas-works for the district within the limits of the Local Board of Health, at an estimated cost of £5000, also for completing the water-works, which will cost £400, making a total of £5400.

It appears to be the desire of all that the water-works should be completed without delay.

There is at present a gas company in Stroud; it was formed as a copartnership concern in 1833, and having been provisionally registered, is was incorporated and reformed in 1858. The company's works are within the limits of the Board of Health, but their mains extend over a great portion of the parliamentary borough of Stroud, lighting the towns of Stroud, and Minchinhampton to a distance of four miles from the works, also the villages of Nailsworth, Stonehouse, Cainscross, and Ebley, at distances varying from one and a half to three miles.

	Per annum.
The signatures to the memorial represent consumers of gas to the amount of cubic feet	3,535,900
Members of the local board who did not sign, but who voted in favour of new works	346,000
	3,881,900

Evidence was submitted as to the various causes of complaint against the existing gas company—namely,

That until the agitation respecting the question of new works was commenced, the town was very badly supplied with gas, and it was constantly left in complete darkness. The quality of gas is bad, and injurious to health.

That as a rule the gas company refuse to lay mains in streets where the poorer classes reside, unless the Town Commissioners contribute a considerable portion of the cost thereof, and this contribution has on several occasions been made.

That the price (5s. per 1000 cubic feet) is excessive, taking into consideration the price of coals and the quantity of gas consumed, being much higher than many towns supplied by local boards of health.

That the gas company charge consumers the same for gas taken close to their works as to those at a distance. They cannot by their Act charge more than 5s. per 1000, which sum is charged to all alike.

That the charge for public lamps is excessive, and at a higher rate than in other towns.

That the illuminating power is less than that in other towns where the gas is charged for at a less rate.

The memorialists are confident that they can supply a better quality of gas at a much lower rate, and urge that the ratepayers should have the benefit thereof; and that any profit derived from the sale of gas to private consumers should be set apart towards the improvement of the town.

I beg to recommend that a provisional order be granted to the Local Board of Health to extend their borrowing powers, and that sanction be given them to borrow for the erection of gas-works, and for the completion of their water-works, the sum of £5400, the money, with interest, to be repaid in fifty years.—I have the honour to be, Sir, your most obedient servant, ROBERT MORGAN.

The provisional order was introduced into a bill of this kind last year, but an intimation was given to the Secretary of State that it would be opposed, and as it was introduced into a bill containing unopposed orders, the Secretary of State struck it out, so as not to jeopardize them. This occurred so late in the session that there was not time to introduce it into an opposed bill, and therefore it necessarily stood over. After the inquiry by the commissioner, and before the provisional order was made, there was a memorial sent to the Secretary of State by the persons who opposed us on that occasion. During the time this matter was going on in Stroud, the gas company applied for and obtained their bill. In March of this year there was an election of six members to serve on the local board, five of whom are in favour of the present application. They voted a resolution when they first met confirming these proceedings, and directing them to be prosecuted. There was no other question at the election of members than the gas question, and most of the candidates who were known to be in favour of this movement were nominated many times over. Mr. Holloway, who proposed the first resolution to establish gas-works, was returned by a considerable majority, at the head of the poll. Of 460 voters, 380 voted for him. The lower class of ratepayers took very little interest in the matter. Of the thirteen members of the board present when the resolution to confirm these proceedings was adopted, nine voted for it, one against it, one was neutral, and two, being shareholders in the gas company, did not vote at all. The one who was neutral I know personally was in favour of it. Since the original application for the provisional order there has been no intimation to

the board of any different opinion on the part of the ratepayers. Looking at the signatures to the petition against this bill, I see they represent very much the parties interested in or connected with the shareholders in the gas company.

THURSDAY, MAY 18.

Mr. *Witchell* recalled, and cross-examined by Mr. PHINN.

The memorial was presented to the board on the 3rd November, 1863. I do not know whether before that day the gas company had given notice of their intention to apply to Parliament for an Act of Incorporation. The local board received a letter from the office of the Secretary of State, dated the 25th June, 1864.

Mr. PHINN: How was it you did not happen to mention that yesterday?

Witness: I do not know how it was: it was not purposely omitted, but counsel had not got it.

Mr. PHINN: Perhaps it was discreetly omitted. I will read it.

Local Government Act Office, 8, Richmond Terrace, Whitehall, S.W. June 25th, 1864.

Sir,—I am directed by the Secretary of State for the Home Department to acknowledge the receipt of your letter of the 18th instant, as to confirmation of the Stroud Provisional Order.

In reply, I have to state that it will not be possible at the advanced period of the session to introduce a new bill for confirming the Stroud order, as it would be impossible to have the order considered by a select committee on the petition of the Stroud Gas Company, in time to allow of the order being ready for second reading in the House of Lords, by the 30th June, after which, by a Standing Order of that House, no confirming bill can be read a second time. Independently, however, of all consideration of time, it seems to the Secretary of State that now that the Stroud Gas Company have obtained parliamentary power, the House would hesitate before confirming an order providing funds for the establishment of gas-works by the Local Board. It would at least insist, that before doing this time should be allowed for experience of the working of the gas company under its enlarged powers.—I am, Sir, your obedient servant. T. TAYLOR.

Edwin Witchell, Esq., Stroud.

Did you answer that letter of the Secretary of State?

Witness: I think not.

Mr. PHINN: Then the Secretary of State having advised for last session that the House would insist, at least, that further time should be allowed for experience of the working of the gas company, under these enlarged powers, you still press this bill. Is that so?

Witness: The Secretary of State took steps to introduce it in February.

Mr. PHINN: Did any other correspondence pass with the Secretary of State subsequently to that?

Witness: I think not until the bill was introduced.

Mr. PHINN: Has not the Secretary of State since directed a letter to be written to you, advising you at least to call a public meeting to discuss the matter before proceeding with the bill?

Witness: He has written a letter.

Mr. PHINN: Just read the letter. Give us the date if you please.

Witness: It is dated the 22nd of March, 1865.

Local Goverment Act Office, 8, Richmond Terrace, Whitehall, S.W. March 22nd, 1865.

Sir,—I am directed by the Secretary of State for the Home Department, to acknowledge the receipt of your letter of the 20th inst., inquiring as to the confirming bill containing the Stroud Provisional Order.

I have to state, in reply, that the Stroud order would only be introduced into a confirming bill, containing opposed orders.

I have to suggest that before proceeding with the order, it might be expedient for the local board to satisfy themselves, that they are acting in accordance with the wishes of the ratepayers in pressing this order in the face of the gas company's opposition, by public meeting or otherwise. I am also directed to inquire whether, as the local board conceive that a public benefit will be secured by their lighting the town, instead of the present gas company, it is impossible to come to terms for the purchase of the gas-works, and so avoid the expense of a parliamentary contest.

(Signed) T. TAYLOR.

Edwin Witchell, Esq., Stroud.

Cross-examination continued: We have not thought it necessary to call a public meeting. I do not remember that we made any reply to this letter. There has been a resolution of the board passed subsequently on this subject, but there has been no action taken on the letter of the Secretary of State. There have been no overtures made to the gas company. It was out of the question our purchasing their works. We had no authority to do it, and could not carry out such a proposition.

Mr. PHINN: Then you did not comply with either of the suggestions of the Secretary of State?

Witness: No; it would have been impossible to comply with them. We obtained what we considered to be the expression of public opinion, irrespective of a public meeting, by the re-election of members of the board who were favourable to the gas question.

Mr. PHINN: So that you thought an expression of opinion, by the election or re-election of one-third of your members, was equivalent to a public meeting?

Witness: Yes.

Mr. PHINN: Was not the truth this, that you did not dare to call a public meeting?

Witness: No. I rather suggested a public meeting. I should not have been afraid of it at all.

Cross-examination continued: We assigned no reasons to the Secretary of State by any correspondence for not adopting either of his suggestions. I saw Mr. Tom Taylor afterwards, and had a long conversation on the subject, and I think I gave him pretty much the same explanation that I have given now. I know we referred to the subject, and I explained that it would be perfectly impossible for us to make overtures to the gas company. I am not aware of any town in the kingdom where such powers as we seek have been given to a local board, there being a gas company already existing. I think the precedents for such powers would necessarily be limited, because there cannot be many towns where the local board have already the power to make gas. I do not know that applications have been frequently made to Parliament to get these powers, and been refused. One of the re-elected members of our board was a gas shareholder. Three of the others might have had other claims on their constituents than that of gas. Another one, Mr. Dickenson, had signed our memorial, and he was a popular man with the electors. Our complaint against the gas company is that they charge the private consumers too high. We are advised that gas can be supplied at a much less price than 4s. 6d. We have always had a little dissatisfaction with the company as to the public lamps until last year. We were informed, and found by some returns of which I cannot give the particulars, but they were statistics published by gas engineers, that we were paying too much. I do not know whether those statistics were Mr. Hughes's or not, but I know we found that we were being charged rather over the price charged in other places. The £2. 16s. which we pay per annum includes the services, lighting, extinguishing, clearing, and maintaining the lamps. The same returns to which I have been referring gave us 7500 or 8000 feet as the quantity of gas consumed by each lamp. I have ascertained that that is the fact, but have mislaid the paper. I should not believe that the charge is at the rate of 3s. per 1000 feet for the gas unless I had some authority for it. I have not made any comparison of the illuminating power of the gas at Stroud with that supplied at other places. I do not know that the illuminating power of the gas at Cheltenham is only 10 candles; I know that a year ago it was very bad there. The gas at Stroud is now very good. When this order was obtained the gas company were not under the regulations of the Gas Clauses Act; they could divide whatever profits they pleased. I believe they are now limited to 10 per cent., and that they are under regulations as to illuminating power. It is stated in Mr. Ranger's report that within our district out of 1500 houses there were 900 under the value of £5. The assessments have been increased since then, but not the rents very materially. The assessment throughout the district is 3s. 4d. in the pound, including the gas-rate. We have no powers over the intervening parish of Painswick, which divides our district. The money which we have raised has been expended over the town portion of the district, with the exception of the cost of obtaining the Act of Parliament, which, I suppose, would be spread over the entire area. We have not had great complaints from the inhabitants of the outer district, that though they pay rates they are neither sewered nor watered, as the rest of the district is. We have had complaints from the owner of some eight or ten cottages that they were not sewered. We had a deputation from the Pagan Hill district as to the lighting, and we told them they could have the light if they paid for it, but that did not suit their purpose. I think we have never had a complaint as to water. There was a question raised by some members of the board that the people at Pagan Hill ought not to be burdened with a sewer-rate, inasmuch as the sewerage works were not carried into that district; but we have had no complaints from owners. We propose to mortgage the rates of the whole district to raise the £5400. We propose to place our gas-works close to those of the existing company. We can arrange to carry our mains alongside of the canal, on private property, without interfering with the rights of other parties. The subject has been mentioned, and we are informed that there would be no objection, but we have made no arrangement. We have no compulsory powers out of our jurisdiction, except for outfalls. I believe there are estimates here of the cost of the proposed works. We calculate that £5000 will embrace mains and everything. I think there will be no difficulty in laying the mains. I only know of one street—Church Street—that is particularly narrow. The people at Pagan Hill complained of want of light. The company's mains are laid there, and also at Bowridge, so that those places could be lighted. The resolution to carry on these proceedings had the vote of all the members of the board who could vote except two, who were absent. I think on the last occasion there were more than nine voted for it. Mr. Walter Stanton is the chairman of the board.

Mr. PHINN: Is this a correct statement of what the chairman said at the board when the letter of the Secretary of State was read at the meeting held on the 2nd August, 1864?—"It is well known that the whole proceedings have now taken another course, which I think is the better one. A perfectly unobjectionable course has been adopted, which I recommended in November last. I had then, as now, serious doubts if it was desirable to mortgage the ratepayers money in speculation. The course now proposed to be adopted is undoubtedly the fairest and most open. Whether it is to be successful or not must depend very greatly upon the management. Though I did not sign the petition, I thought and think that it was not desirable our property should be any further mortgaged." Was that with reference to a suggestion that a consumers company should be formed, and that the gas company should be fought by another rival company, without reference to the rates at all?

Witness: I cannot say that it was with reference to anything of the sort at this distance of time.

Cross-examination continued: I know that in the latter part of 1864 there was a consumers association proposed, but I had nothing to do with it. I suppose that when Mr. Stanton says "a perfectly unobjectionable course has been proposed," he does allude to the consumers company. He has all along expressed a doubt about mortgaging the money of the ratepayers, although he has voted with the majority at all the divisions. He is not a gas shareholder. I cannot remember that he recently said:—"If we had the power, we ought not to exercise it. I cannot say what the owners of property think about our proposal; I have never heard any objections from them. [The witness was further examined as to the parties by whom the bonds for money borrowed by the board are held, and as to their signing the petition against the bill.] I recognize the names of a good many persons who have signed the petition who are not connected with the gas company. There has been an active canvass for signatures to it. I do not think there was an active canvass to get signatures to the memorial to the board. I heard that our own collector carried the memorial about with him to get signatures, but there was no local canvassing, for I never heard of it till it was presented. The petition contains the names of a large number of persons who are not charged with gas-rates at all. I know the report of the Government inspector who was sent down. I gave him some materials for that report. These inquiries are generally of a free nature, in which anybody says whatever they please which is pertinent to the subject. We have a site for the proposed works, but it is competent for us to purchase a more convenient one, if necessary. We must have this one or some other that we can get by agreement, as we have no compulsory powers. I do not think we could fix on a site in the heart of the town; we should very soon be stopped if we did so. The gas company would not allow us to have it there.

Re-examined by Mr. H. JAMES: The works of the gas company supply a large outlying district beyond the rateable limits of the board. They have 20 miles of mains altogether, and we should have no power, if we purchased their works, to supply all that district. The local board would have no objection to insert a clause in the bill limiting the mortgaging of rates to those levied in their lighting district. At the election in March there was an opportunity for the whole of the electors to express their opinion on this subject. Only one member who opposed the Government—Mr. Bishop—was elected. He had been previously at the head of the poll, but at this election was quite at the bottom, and had very nearly been left out of the nomination altogether. I think by that election we obtained an expression of the opinions of the inhabitants without any canvassing. Our chairman is not a gas shareholder, but his cousin, who is his partner, is the holder of 400 shares. Some of the mortgagees of the rates are gas shareholders. Mr. Lewis, who is a mortgagee, signed the memorial to the local board. The mortgagees have the first claim upon the rates, whatever becomes of this bill.

Mr. George Holloway, cross-examined by Mr. H. JAMES.

I am a wholesale outfitter, residing at Stroud, and one of the largest ratepayers. I have been a member of the local board for six or seven years. I have taken a considerable interest in the gas question; it has been forced

upon me as a member of the board. Having lived in the centre of Stroud, for the last 16 years, I know perfectly well the opinion of the town upon this, or any other question. With the exception of a very few persons, the opinion is almost unanimous that the Local Board of Health should erect works, and supply the town with gas. Some of the shareholders in the company are influential persons in Stroud, and have used their influence in opposition to this bill. The canvassing for their petition has been more like that at a borough election than anything I have ever seen before. Notwithstanding that, the opinion of the town is still in favour of the proposition of the Board of Health. I have heard of some two or three, who previously were very warm in our favour, having signed the petition; but I sincerely believe it has been through extraordinary pressure put upon them. We should prefer that the money borrowed for the gas-works should be upon a mortgage of the rates of the lighting district; the other portions are agricultural, and thinly inhabited. There is room in the streets for the laying down of a second set of mains, and there could not be any objection to our proposal on that ground. When the board were thrown over for a year by the delay in getting the provisional order, it was thought desirable, by many persons, that a private gas company should be formed, and that works should be erected with the view of selling them to the Board of Health, as soon as they obtained the power. We had not the slightest difficulty in getting capital subscribed for that company; on the contrary. I canvassed the town for the shares myself, and in three days the whole of the capital was taken by both large and small consumers of gas. The terms of the company were, that no person should take more than 5 per cent. interest on that capital. The subscribers and others who guaranteed to take the gas of the company, represented a consumption of between 4 and 5 million feet per annum.

Mr. H. JAMES: I believe that proposition went off, because it was found that no power could be given to break up the streets without coming to Parliament?

Witness: We had the opinion of counsel, and found that the local board could not give the power to open the streets.

Mr. H. JAMES: That though the power existed in the board they had no power to transfer it to a private company.

Witness: No.

Mr. PHINN: I understand you rightly, if Parliament thinks competition is necessary in Stroud you would have no difficulty in getting up a private company, and obtaining capital enough to compete with the existing gas company.

Witness: It has been done.

Mr. PHINN: Then why do you want to mortgage the rates?

Witness: Because we were advised that the local board could not transfer their power of opening the streets.

Mr. PHINN: You should have come to Parliament with your capital, and shown the necessity for another company.

Witness: We had no difficulty in getting capital, but we imagined this would be the least expensive to the town.

Mr. PHINN: You are to fight a private company with money borrowed on the rates; is that your commercial creed?

Witness: The town of Stroud being sufficiently large for gas-works of its own, the inhabitants think they are very badly used by the gas company extending their mains right and left in all directions over the country.

Cross-examination continued: At the present moment the gas is much better than it was. For many years it was wretchedly bad, so bad that the weak people used to faint in their rooms from the impurity of it. I am aware that the company have now got an Act of Parliament which places them under obligation to give an illuminating power of 13 candles, but we think a few months good behaviour ought not to condone for years of bad. We do not wish to punish the company at all; we think that they will have a very splendid business after our small spot of Stroud is taken away from them. We shall be very happy to buy their mains. I think we should have power to do so without putting it in the bill. I do not know what the legal difficulties might be to such an arrangement. I believe we ought to have the exclusive possession of Stroud, and that if this bill is passed we should supply the whole of the inhabitants. The board would be able to supply gas at cost price, and it would not answer the purpose of the company to supply at less than that for long. I did not exactly get up this movement, but persons came to me and wished me to bring forward a motion that the board should put in force their powers for erecting gas-works. I did not go about with the memorial. We discussed the letter of Mr. Tom Taylor at the committee meeting, and came to the conclusion that as we were on the eve of an election that would afford the opportunity for obtaining an expression of public opinion on the subject.

Mr. PHINN: Did the Secretary of State also recommend that overtures should be made to the gas company, and more were made?

Witness: The Secretary of State, through Mr. Tom Taylor, made sundry suggestions, which we thought were of very little weight. For instance, he undertook to speak for both Houses of Parliament as to what would be the effect of our application here.

Mr. PHINN: You thought the Secretary of State had nothing to do with it?

Witness: We thought that Mr. Tom Taylor, at all events, could not speak for both Houses of Parliament.

Mr. PHINN: And that the Stroud Local Board might?

Witness: No, not that. In fact, we looked upon his letter as a piece of impertinence.

Re-examined by Mr. H. JAMES: I have heard that a deputation from the gas company waited upon Mr. Tom Taylor before the last letter was written.

Mr. *W. F. Blake*, examined by Mr. H. JAMES.

I am a druggist in Stroud, and a member of the local board. I have taken an interest in the gas question, and know pretty well the opinions of the inhabitants. I believe they would like to have the works in their own hands. By a house-to-house visitation, I have ascertained what would be the amount of gas probably taken in the town, and believe it would be between 6 and 7 million cubic feet annually, including the supply to the public lamps. That was the quantity then. The public lights consume about 800,000 cubic feet.

Cross-examined by Mr. WINTERBOTHAM: There are two banking companies in the town. I do not know what the opinion of those companies is upon this question. I dare say they are petitioners against the bill. The Castle is one of the largest houses in the town. I do not know whether Mr. Fisher, the proprietor, has signed the petition; I dare say he has. I do not know whether he is a gas shareholder; some of his family are shareholders. In my estimate of 6 or 7 millions consumption, I have not included all the houses. I think I obtained the consumption at the banks. I have no knowledge of the consumption of gas except as I have obtained it in this way. I do not know that 5 million cubic feet is the maximum supplied by the company. I assume that we should get pretty nearly the whole of the supply; that is the basis of the probable success of our scheme.

Mr. *R. Grist*, examined by Mr. H. JAMES.

I am a flock manufacturer at Stroud, a large consumer of gas, and a large ratepayer. I have some acquaintance with the supply of gas, having been a director of the Brimscombe Gas Company, which is in the neighbourhood. At the time the memorial was presented to the local board, the feeling of the inhabitants and large ratepayers of Stroud was very strong in favour of this proposition. I believe it is still so, but I do not reside in Stroud. The cost of coal at Stroud would be, for Welsh coal from Newport, about 12s. 3d. or 12s. 6d. per ton; and for Forest of Dean coal, from 10s. to 12s. 6d.

Cross-examined by Mr. PHINN: I know that in many places where coal is about the same price as at Stroud the charge for gas is much less. Huddersfield, for instance. The consumption of gas at Huddersfield is ten times as great. I think, probably, coal is a little less there. I know nothing about Cheltenham, or Gloucester, or Cirencester. At Brimscombe the paid-up capital of the gas company is £3000, and we have spent out of profits about £200. The present consumpsion of gas is from 2 millions to 2¼ millions per annum, and the illuminating power of the gas 13½ candles. We have a photometer at the office of the works. There is not the least public check over us. The photometer has only recently been set up and experiments made within the last few weeks. We are using two-thirds of Welsh coal and one-third Forest of Dean coal. I have never tested the latter alone, so as to know whether it will make 13½-candle gas. We have used the mixture of coal I have referred to for the last three years. I think the photometer was set up a fortnight ago, and the experiments were made within the last week. I cannot tell how many days they extended over. There were three experiments and three makings. Our engineer knew pretty well what was going on. We have only paid two dividends. We have been established five years. We divided 6 per cent. last year and reserved 1 per cent.; the year before, 4 per cent. and reserved 1 per cent. The dividends paid would not average 3½ per cent. upon the five years; but that is not a fair way of putting it. We did not expect to be prosperous at the beginning; we expected to be without dividends for a couple of years, and we are quite satisfied. We expect future years to be much better, so as to reconcile us to having no dividends at first. We charge 5s. to large consumers, and 5s. 6d. to small ones; but we are only a small company supplying a large district.

By the CHAIRMAN: The average price of the coal we use may be about 12s. per ton.

Re-examined by Mr. H. JAMES: The quality of our gas is, as nearly as I can estimate it, the same now as before the photometer was used. We have made no alteration in the quality of the coal used, or the mode of manufacture. The same man has been on the works all the time, and he had strict orders to strike his retorts, and to charge them at the time of the experiments precisely in the same way as they had been done during the last three years. Our capital expenditure a little exceeded what we at first anticipated, and we have had to expend £200 out of revenue. Our profits last year were rather over 9½ per cent. We supply a large outlying district, with a small quantity of gas. We have 7000 yards of mains, besides services. I understand that the charge at Stroud is the same as we charge in the outlying district. It costs more to supply such a district than a more populous one. If we were in Stroud, we could sell gas at 3s. 9d. or 4s. I have seen the last half-year's revenue account of the Stroud Company. The quantity of gas they supply, I should think, is from 16 to 17 millions. I thought it was 19 millions at first, but I understand that for a short period some of the outlying districts were being charged an extra 6d. per 1000 feet, until a certain fund was extinguished, and therefore my calculation is disturbed by that.

Mr. *William Holmes*, examined by Mr. H. JAMES.

I am a carrier, residing at Stroud, and a member of the Local Board of Health. I was unavoidably absent when the vote on the gas question was taken, or should have voted in favour of the resolution. I believe the opinion of the inhabitants is in favour of it. I am a large ratepayer, but only a small consumer of gas.

Cross-examined by Mr. PHINN: I believe it is calculated that we shall supply gas at 4s. The inhabitants feel that for some time the gas company have not acted liberally towards them, and therefore they are very desirous to have their own works. I do not know any town where a Board of Health has been allowed to establish gas-works in opposition to an existing company. I have not studied the question much; it does not affect me much, and I have simply voted with the majority of those who have elected me.

Mr. *Samuel Hughes*, examined by Mr. H. JAMES.

I am a civil engineer, having offices in Park Street, Westminster. I have been for about 25 years engaged in that profession, and during the last 15 years I have to a great extent devoted my attention to the question of the supply of gas. I was engaged during the whole of the metropolis gas inquiry, which lasted during three sessions of Parliament. I was acting then as engineer for 26 out of the 39 vestries and local boards constituted under the Metropolis Local Management Act, and I had then a full opportunity of acquiring information respecting the metropolitan gas companies. I have been engaged in all parts of the country for corporations and local boards in making arrangements with gas companies, and for rating purposes. I have examined the town of Stroud in relation to the proposed gas supply. There is no doubt that where the supply of gas is confined to a limited area with a large population it can be sold very much cheaper than in a large and thinly populated area. From a rough calculation that I have made, it appears to me that the extra cost incurred in Stroud in supplying the outlying districts in the price of gas is 9d. per 1000 cubic feet higher than in the town itself. That is taking no account of the leakage. If I include the leakage, I think, on the most moderate estimate, the price in the town should be 1s. per 1000 cheaper than in the outlying district. There are many instances in Acts of Parliament where a much higher differential rate is fixed. In many Acts 1s. 6d. per 1000 is fixed as the difference between the price charged in the town and in the surrounding district. In the metropolis itself there is a differential price; in the densely inhabited parts they charge much less than they do in the outlying districts. I have made a calculation as to the price at which gas should be supplied in the town of Stroud proper, on a certain assumption—viz., that the local board are satisfied with 4½ per cent. interest upon the capital employed, and, in addition, a sinking-fund amounting to 1/50th per annum of that capital—*i. e.*, to enable them to pay off the capital in 50 years. Those are the terms the board themselves proposed in memorializing the Secretary of State.

The CHAIRMAN: Is not that a term of unusual length?

Witness: No; I have heard of 40 or 50 years.

The CHAIRMAN: I thought 30 years was the usual period?

Witness: I simply took it from the printed paper which your lordship has, containing the proceedings in the inquiry before the inspector sent

down by the Secretary of State. I found there that the proposal of the board was to pay off 1/50th each year.

Examination continued: I estimate the cost of erecting works for making 8½ million cubic feet of gas, and supplying 7,300,000 cubic feet per annum, at £4516. The revenue derivable from that consumption would be as follows:—By sale of 7,300,000 feet of gas, at 3s. 6d. per 1000, £1277; by sale of coke, tar, ammoniacal liquor, and other residual products, £275, making the total receipts £1552. The expenditure for 1000 tons of coals to make the gas—which I take at 14s. per ton, because I assume that, in addition to the coal which would be used at 12s. per ton from the Forest of Dean and from Newport, a small portion of cannel coal would be necessary to make 14-candle gas—would amount to £700. To that I add the expense of manufacturing the coal into gas £500; total expenses, £1200; leaving a balance of £352, which would be thus appropriated:—4½ per cent. on the capital of £4520—£203; redemption-fund, 1/50th part of the capital, £90; total appropriation, £293; leaving a balance which may go to reserve-fund, or any other purpose, of £59. In this calculation I have assumed the payment of the full interest on the whole capital for the 50 years, not considering that the redemption-fund will diminish it year by year, so that the sum which the board would have to pay out of their revenue for gas would constantly be reduced. When the capital was all paid off the works would be free of charge, and it would then be possible to supply gas much cheaper.

By the CHAIRMAN: I have allowed in my calculation for wear and tear.

By Mr. H. JAMES: My own impression is, that the town is fully capable of consuming this quantity of gas, and even a much larger quantity at the reduced price; but I have made an estimate for a less consumption. Supposing the quantity distributed to be 6 million feet per annum, I calculate the capital required would be £4059, and the revenue £1050, and the total receipts for gas and residuals £1277. The expenditure would then be £989, leaving £288 as profit, which would be appropriated thus: 4½ per cent. on the capital, £183; sinking-fund, 1/50th part thereof, £81; making together £264, and leaving for reserve-fund £24. I am satisfied that my estimates are exceedingly liberal, and that the works can be constructed and gas sold at the prices I have given. If gas is to be supplied in the outlying districts, I should have to raise the price at once 1s. per 1000 higher, even to pay the rates that I have assumed for Stroud proper. I have had the opportunity of considering the advantages resulting from the supply of gas by local boards. There can be no question that there is a great advantage if the local authorities determine not to follow the example of gas companies, by charging excessive prices If they would be satisfied with charging the simple cost price of the gas, with a moderate interest on the capital employed, I believe it would be extremely beneficial to the town. The great error made by the local authorities who now supply towns with gas is, that they seek to emulate the gas companies, and charge excessive prices. In Manchester, for instance, the corporation make about £40,000 a year profit by the supply of gas, which goes in relief of their rates. I do not think that fair, because it burdens the gas consumer, and relieves other persons who do not burn gas. In Manchester the middle stratum of society, the workpeople, and the shopkeepers are the gas consumers; the lower classes do not burn gas, and the higher classes do not burn gas at their villas and country residences, so that they are really benefited at the expense of the gas consumers. I have taken in my present calculation 14 candles as the illuminating power of the gas, because Parliament has recently prescribed that standard in a number of Acts.

Cross-examined by Mr. PHINN: I have never actually put up gas-works, though I have made designs for them. I have never superintended a gas company in my life; it would not answer my purpose to do so.

Mr. PHINN: Have you not been called the "great gas agitator" for the last ten years?

Witness: No; I am not aware that I have, except by persons who know nothing about it. That term was first applied with reference to the metropolis. The gas companies were the agitators in that case; they chose to district, and divide the metropolis amongst themselves, and the parties with whom and for whom I acted sought to make arrangements in consequence of that disturbance.

Mr. PHINN: Was not the end of it this, that Parliament rejected your proposal, and adopted the very districting system that you complain of?

Witness: Not at all; we supported the districting, with proper arrangements. We were willing to have the metropolis districted, but we wanted to have a regulated monopoly, and not such a monopoly as the gas companies chose to create.

Mr. PHINN: What has been the effect of it in the metropolis?

Witness: The effect has been most beneficial. The price of gas has gone down from 4s. 6d. to 4s. in every one of the thirteen companies. One company, indeed, only charges 3s. 9d. at this moment. The saving to the consumers has been more than £200,000 a year, though the Act was so lately passed.

Mr. PHINN: Has it not been complained of in certain parishes, and are not the parishes under your auspices trying to disturb these arrangements; in Marylebone and St. Pancras, for instance.

Witness: Not at all. There have been handbills issued by persons who understand nothing about it, talking vaguely of the repeal of the Metropolis Gas Act; but no parish in the metropolis has dreamt of such a thing. On the contrary, they are too well satisfied; they know the benefit they gain by the existing arrangements.

Mr. PHINN: Will you tell the committee any town in England, except Walsall, in which a company existing and regulated by Act of Parliament, has been allowed to be competed with by a local board out of the rates?

Witness: I fancy Macclesfield is a case in point.

Mr. PHINN: I am asking a simple question; let us not have any fancies about it. Do you know any town where a company is under the Gas Clauses Act (except Walsall), where Parliament has allowed the local authorities to come in and compete with them?

Witness: The case of Walsall is not so strong as you put it. There the gas company compete with the corporation, who were the first to supply gas there. There may be such cases as you refer to, but I am not sufficiently acquainted with all the circumstances to answer you; but I think there are no towns which have the ancient powers which Stroud has, to erect works and supply the public.

Mr. PHINN: Take Exeter; have not the Improvement Commissioners of Exeter the same power?

Witness: I do not know that they have; I will not be positive.

Cross-examination continued: My figures rest upon the consumption of 7, 6, or 5 million cubic feet of gas per annum. I should not be very much surprised to hear that the company only supply 5 millions. If the company are left in competition with the local board, I think the reduction in the price of gas would cause a great increase in the consumption; so that I should still assume 5 or 6 millions for the supply by the local board. In the metropolis, the consumption is more than 2000 feet per head of population, and applying that to Stroud, it would give a total consumption of 14 millions. In Birmingham, and other towns, the rate of consumption is much greater. It has entered into my calculation that out of 1500 houses in Stroud rated to the improvement rate, 900 are under £5. In the poorest houses in Scotland they consume gas; it is used universally all over the house, and for cooking purposes. If you had cheap gas here, I think the consumption might be at the rate of 3000 feet per head, as it is in Birmingham. The artisans of Birmingham do not use gas, except to a small extent. The price there is 3s. 6d. At Stroud, no doubt, a great deal of gas is consumed in the mills. The public lamps number about 70. I should think their consumption would be less than 800,000 cubic feet per annum. I have never found the public lamps burning anything like the quantity the company contract to give.

Re-examined by Mr. H. JAMES: I think paraffin oil would very well compete with gas, even at 3s. 6d. per 1000. I do not know whether it would be cheaper than candles. The cheapest material the poor can burn is paraffin oil.

The CHAIRMAN: I think we need not go into the comparative merits of other methods of lighting.

By Mr. JAMES: When local boards have the management of gas-works they save some of the expenses to which companies are subject. The expense of direction they save entirely, and also in collection, because they collect the gas-rates by means of their present machinery.

Mr. PHINN: The saving depends upon whether they collect by poundage or by salary.

Mr. *G. W. Stevenson*, examined by Mr. H. JAMES.

I have been in practice as a civil engineer for upwards of 18 years. I have made independent estimates which confirm Mr. Hughes's figures; in fact, his estimates are a little too liberal. I believe the works could be constructed and gas supplied at the prices given by him. If the capital had to be repaid in 30 years instead of 50 it would just absorb the whole of the profits. There are many advantages which a local board possess in having the gas-works in their own hands which a company does not possess; among others there is less cost of management. I have not personally visited Stroud, and therefore I was dependent upon Mr. Hughes for the probable consumption of the district, and I have taken his figures on this point, and have made my calculations on the basis of 7 or 6 millions.

Cross-examined by Mr. PHINN: I am not aware that in 1853 the Halifax corporation applied for powers to compete with the gas company, and failed. The corporation bought the works of the company. A competing company sought to get powers by Act of Parliament, and they had a clause in their bill that if they did get an Act they would transfer their works to the corporation. Instead of that, the old company made advances to the corporation, who came to terms with them, and the bill was abandoned. The corporation are now the sole suppliers of gas in the town. I cannot give an instance in which Parliament has given powers to a local board to raise money by mortgaging the rates in order to compete with an existing company. I have known cases in which corporations have applied for powers to purchase existing gas companies compulsory, and have failed. I was not in the Bolton case last year, but I am acquainted with it. I do not remember that the gas company effectually resisted the corporation when they sought power to take their works compulsory. I know that the corporation were refused permission to manufacture gas. It is quite possible that at Bolton the company were doing their duty to the public. I do not know anything of the Stroud company, but I think their capital is very large; it is something like £18,000. I have heard that they supply 12 million feet of gas per annum. I do not know who told me. At Halifax coal is 10s. a ton, and cannel 21s. We use a mixture of 10 per cent. cannel. The illuminating power is 14 or 15 candles, and the maximum price 4s. We charge the maximum to small consumers, with discounts down to 3s. 2d. to large consumers. The discount begins when the consumption amounts to £5 a quarter. The annual consumption of gas in Halifax is about 100 million cubic feet.

Re-examined by Mr. H. JAMES: The corporation make nearly £10,000 a year profit. The price of gas at Halifax is rather too high, and I advised the corporation to reduce it some time ago. The profit is applied first of all in payment of interest on the borrowed money, and a certain portion afterwards towards a sinking-fund to extinguish the capital. The residue is applied to the improvement of the town; it is carried to the borough fund in reduction of the rates.

By the CHAIRMAN: I cannot give the amount which was carried to the payment of capital. The actual profit made is 7·92 per cent. on the capital. It was more than that when the capital was small; but the works are now in excess of the demand upon them, so that a good deal of the capital is unproductive on that account.

By Mr. H. JAMES: We pay about 4½ per cent. interest upon the borrowed capital. There are 9000 consumers in Halifax, and more than half of them pay the corporation less than 6d. a week for gas. Almost every cottage and house in Halifax has the gas.

Mr. *T. A. Hedley*, examined by Mr. H. JAMES.

I am a civil engineer, and have been connected with the management of gas-works for more than 30 years. I think that the erection of works and laying down pipes to supply the quantity of gas estimated for at Stroud would be £4000. I consider Mr. Hughes's figures very liberal. I could find a person who would undertake to rent such works after they are built, and allow £300 a year for them, or give the local board 1s. for every thousand feet of gas sold at 3s. 6d. I take the price of coal at 14s., and the consumption of gas at 6 millions annually. In almost all Acts of Parliament a differential rate of charge is fixed for the outlying districts supplied. I could find a responsible person who would build the works for the sum I have mentioned.

Cross-examined by Mr. PHINN: It would not be an element in the calculation whether the parties were to have the exclusive supply; they would do it with the existing pipes of the company running through the place. I know of no case where a local board has been allowed to compete with an established private company.

Mr. H. JAMES said this was the case on the part of the promoters of the bill.

Mr. PHINN addressed the committee for the Stroud Gas Company. He said he had hoped that the committee would interpose and stop the further progress of the case so soon as the clerk to the local board stated that the course suggested as the proper one by the Secretary of State had not been adopted. It appeared to him that the Secretary of State, who really had the conduct of this bill, had pointed out to the local board that under the altered circumstances of the case, since the provisional order was applied for, they could not expect to get the sanction of both Houses of the Legislature to a proceeding so novel as the one now brought before the committee. At least, after such a communication as they received, they were bound to ascertain the opinion of the inhabitants of Stroud in public meet-

ing assembled, or else, as honest men, to have made proper overtures to the gas company. That was the view of the Secretary of State, although the witness who was an outfitter seemed to think it would not be a proper course to adopt. He (Mr. Phinn) was almost inclined to leave the case as it stood in reference to this fact alone, and to ask whether it was not in conformity with the established usage and practice of Parliament that when the Government had charge of a bill of this kind, and indicated the course of action which should be pursued, the promoters were not bound to adopt the line suggested by the Government, and accept the conditions which it imposed. No doubt, in deciding upon the question before them, the committee would bear these circumstances in mind; but as it was their pleasure that the case should proceed, he should be obliged, in the interests of the three classes of clients whom he represented, to place before them certain evidence on their behalf. His learned friend, Mr. Cripps, who certainly had a difficult case to advocate, adroitly kept from the committee a large amount of information which it was very important they should be in possession of. In the first place, Mr. Cripps did not call attention to the fact, which was clearly brought out by the cross-examination of his witnesses—viz., that the committee were asked to go upon a new principle, and to establish a rival gas-work in opposition to the works of an existing company, the former being supported out of the public rates, while the other was carried on out of the private resources of a body of shareholders. The only vindication which could be attempted of such an extraordinary proceeding was that originally in the Act which incorporated the commissioners at Stroud, there were certain clauses which enabled the local authorities to construct gas-works and light the town with gas. But surely the observation at once arose—these gentlemen had had the power to do so for now 40 years, and yet they had never taken any action upon it in any way whatever, but had for a period of some 38 years been actually contracting from time to time with the very gas company whose operations they now sought to interfere with. If they had had any substantial grievance with the gas company such as had been alleged, but which had not been established, or even attempted to be proved, the commissioners or their successors, the local board, would have come to Parliament before now for authority to borrow money, if necessary, in order to carry out the provisions of their original Act. They had not chosen to do so, and it was now necessary to find an excuse for so doing. Accordingly his learned friend stated that the commissioners had had a contract with the gas company for 21 years, which had only recently expired. But upon examination it turned out that this part of their case was just as baseless as the rest, for the contract expired in 1855, so that the local board had had 10 years in which they had been willing to go on groaning under the intolerable yoke of the gas company. Now the power which the local board possessed was acquired by them on the transferrence of the duties of the original commissioners to them. The powers were continued because they existed; but it was important to observe that the Local Government Act, as it originally passed, which prohibited the borrowing of more money than the assessable value of the property in the town for one year, contemplated only sewerage and water-works. It was never designed by Parliament, as an examination of the section of the Act would show, that moneys so borrowed should be expended in the erection of gas-works. And even with regard to the 19th section of their Act, upon which the promoters seemed to rely, it was very doubtful in point of law, whether the provisional order which sanctioned the borrowing, was applicable to permanent works of this kind. He said it was doubtful, and the allegation in the petition was inserted with the view of raising that question. The Act of Parliament did not specifically refer to gas-works, and obviously the framer of this clause did not seem to have referred to the original clause which evidently related only to sewerage and water-works. He had used words which might be construed as sanctioning the views entertained by the promoters, but it was by no means clear that this was necessarily the object he had before him. And the reason why a clause of this kind should be literally construed was sufficiently obvious. If the local board had to come to Parliament, not for the confirmation of a provisional order, but for an ordinary bill to authorize the construction of gas-works, they would have had to give the ordinary parliamentary notices, and to have bound themselves to a site for the works. They would also have been obliged to put themselves under the provisions of the Gas-Works Clauses Act, 1847, and to have gone through all the stages of a private bill, so as to assure to the public all those safeguards which Parliament always imposed upon undertakings of this description. He (Mr. Phinn) could not believe that it was ever in the contemplation of the Legislature, that the power of borrowing to the amount of one year's assessable value should be extended to a second or third year for the purpose of erecting gas-works, so as to enable a local board to compete, out of the money of the ratepayers, with the proprietors of a private gas company. There was no mention of gas-works in any of the Acts of Parliament, and it was difficult to conceive the possibility of the framer of the clause relied upon having in view that by means of a provisional order such an enterprise might be taken in hand by the local authorities. That this was a sound conclusion was supported by the fact that in no single instance had an application ever before been made to Parliament for the confirmation of a provisional order for the purpose of erecting gas-works under the extended power of this clause. These considerations, he should have thought, would have made a short end of the present case, for it was clear, if he were correct in his judgment, that the provisional order was nothing at all. If the provisional order were not such an one as was contemplated by the amending Act, then there was nothing to confirm; for though, no doubt, it would have the effect of an irregular Act of Parliament, it would not be what Parliament contemplated when it introduced this mode of summary legislation, and dispensed with the ordinary safeguards in connexion with such undertakings. He submitted to the committee that this was an argument worthy of consideration, especially when taken in connexion with the letter of the Secretary of State, which expressly pointed out the propriety of holding a public meeting to ascertain the views of the ratepayers, or that some overtures should be made to the gas company before the bill was prosecuted. Now what was the new principle proposed to be introduced by this bill? It was that of allowing a local board to borrow money on mortgage of the public rates, in order to compete with a gas company already established by Act of Parliament. It had been suggested to him that a precedent could be found for such a course in the case of the town of Walsall; but it now turned out that the reverse was the fact. The local authority there had the power to supply gas, and actually did supply it, but probably did it so unsatisfactorily to the ratepayers that a commercial company was introduced for the purpose of remedying their defects. Throughout the whole range of legislation, whether by provisional order, confirming Acts, or by special incorporating Acts, there was no instance on record of an existing company being competed with by the local authorities out of the public money of the ratepayers. There had been in this House, and in the other House of Parliament, many discussions as to the propriety of sanctioning great manufacturing departments in connexion with the Government to compete with individual enterprise; but the present proposal went a step further, for Parliament were asked to allow a local board to impose upon the whole area of their district, whether lighted or not, a rate for the special purpose of lighting only a portion of that district. And under what guise did this case come before the committee? The very chairman of the local board, when the discussion was raised in August last (the circumstances under which the provisional order was obtained having been changed by the introduction of legislation in reference to the gas company), expressed his opinion that it would not be wise to mortgage the rates for the purpose of establishing this competition. And it only showed how men would sometimes act against their own consciences, for Mr. Witchell said to the committee, "Yes, the chairman voted one way though he talked the other." It was very astonishing that the chairman, who was evidently a political economist, and took sound views on this matter, should thus have voted against his own opinion. Probably it was done under some pressure by his constituents. But now he (Mr. Phinn) would ask what case was there upon the merits for this proposition. Had the gas company been charging excessive rates? No one had ventured to say that 4s. 6d. was an excessive price, considering the circumstances of the town. He was not about to go into the detail of the return lately laid before Parliament respecting the various gas companies of the kingdom, but he would venture to say that, looking at that return, it would be found that with a similar area of supply, and with coal at 14s. per ton, the price of gas at 4s. 6d. was fair, as compared with other towns. Then was there any charge against the company on the ground of the quality of their gas? The company came before Parliament last session, and placed themselves under the provisions of the Gas-Works Clauses Act, binding themselves to supply gas of an illuminating power of 13 candles. No complaint had been made that they had not complied with the obligations they then took upon themselves. The cases of Brimscombe and Huddersfield which the witnesses had referred to, proved nothing to the prejudice of the Stroud Company, but rather justified the policy they had carried out. With regard to the calculations which had been made as to the cost of the proposed new works, he (Mr. Phinn) did not propose to trouble the committee by going through them, because they were but the superstructure of the fabric whose foundations he maintained were utterly worthless. He was not about to quarrel with the projected outlay as far as the figures were concerned; he objected to the foundation upon which they all rested. The promoters said they anticipated a consumption of 5, 6, or 7 million cubic feet of gas per annum; but what a fallacy was this. The gas company were already in the town with their mains and pipes in all directions. Was it to be supposed that they would allow these mains and pipes to remain as old iron in the ground? There was no power in the bill for the local board to buy them, or to prevent any one in the town from being supplied with gas by the pesent company. If the local board supplied at 3s. 6d., the company would go down to 3s. 3d., and so on. The ratepayers would soon get tired of this game, and by-and-by there would be a combination, and the supply would again be left in the hands of the company, or the board would have to seek fresh powers in order to buy up their works. It was absurd for the promoters witnesses to make their calculations upon the hypothesis of an exclusive and not a competing supply. The evidence about to be adduced would satisfy the committee that the actual supply in the town was about 5 million cubic feet per annum, and that the poorer classes, although the price had been so much reduced, did not consume gas at all. He was not about to enter upon the inquiry whether paraffin oil or candles were cheaper than gas. He was convinced that throughout England, whatever might be done in Scotland, where somehow or other gas was infinitely purer and better than here, it was not likely to come into competition very largely among the poorer classes. In point of fact, the use of gas was arrested in the social scale at the point where the small shopkeeper merged into the mechanic. The small shopkeeper found it more economic than candles, but in the case of working men, who went to bed early and rose early, and did not require much artificial light of any kind, gas was not likely to be very great if introduced. There was one thing he had expected to hear in the course of the promoters case—viz., allegations that the company were charging an excessive price for gas. But there had not been a single person called to complain either of the price or of the quality of the gas. It was true the promoters said they could supply gas cheaper; but how? Only by this hazardous experiment. He should be prepared to point out that these commissioners, having the rates to the amount of nearly £18,000 per annum, had grossly neglected their duty to the out-districts. Those out-districts were not sewered nor watered as they ought to be, and it would be shown by the testimony of owners of property, and others who were deeply interested in the locality, that the first thing which ought to be done, if any money at all was to be raised, ought to be the sewering and water supply of these out-districts. The truth was, the local board had exercised their prerogative of rating to such an extent, that complaints were being made of persons going to reside in the adjoining parishes of Painswick and Rodborough, to escape their liability to the payment of rates for which they had no equivalent advantage. In the out-districts of Stroud, which were not watered or sewered, the rates were 2s. 10d. in the pound, and the witnesses to be called would tell the committe that in their opinion if more money was to be raised by borrowing it ought to be applied to those purposes. If that were done, their heavily assessed property would rise in value, and Stroud would be able to compete with adjoining towns. But they would also say: "Do not let us have this burden of erecting gas-works put upon us—a burden which will be productive of no advantage to us." It was true his learned friend said the promoters were willing to introduce a clause limiting the rating power to the area benefited. But he could do nothing of the kind. There had been no meeting of the local board to sanction such a proposal, and the Secretary of State had not assented to such a modification of the provisional order. To talk about inserting such a clause was not to ask the committee to confirm the order, but to introduce new legislation—and legislation which had never been contemplated by the people of the town. His learned friend must stand or fall by his provisional order; and he admitted it to be unjust, because it mortgaged the rates of the whole area, though only benefiting a portion. To him (Mr. Phinn) the case seemed to be founded on no tangible or definite principle at all. It was not founded upon precedent; it was not founded upon any delinquency of the gas company; it was not called for by any public necessity; nor was it calculated to benefit the great bulk of the ratepayers of Stroud. With regard to the other parties to the petition —the present mortgagees of the rates—they clearly had a right to be heard, and to protest against their security being imperiled by fresh mortgages being effected. They lent their money upon the assurance given by Parliament that in borrowing, the local board should not exceed the amount

of one year's assessable value, and that the money should only be applied to the limited specified purpose of water supply and sewerage. The gas company, too, had an obvious interest in this question. They were prepared to show that this proposal was unwarranted by precedent and that it was introducing a new principle, the result of which it was impossible to foresee. They were now before the committee to vindicate their conduct, and to state that when their bill was before Parliament last session they made certain representations to the local board with regard to the public lighting. They were prepared to show that the public lighting of Stroud was carried on in a way which would bear comparison with any other town, and also to explode the absurd fallacy that the lighting of the outside district was of no benefit to the inner district. They would call before the committee some of the large private consumers of gas in Stroud, who would state that as respected the price, purity, and illuminating power of the company's gas, they had no complaint to make; and though of course it would be to their interest to introduce this competitive rival power in the district, by which the price of gas was to be reduced, they would tell the committee that they did not desire it, and that they were apprehensive, if the rates were further mortgaged for the erection of gas-works instead of for sanitary purposes, the value of property in the district would be essentially diminished. He did not know that there were any other points which it would be necessary to bring before the committee. He submitted, in the first place, that the Act of Parliament never contemplated the borrowing of money upon a second year's assessable value for the purpose of erecting gas-works; secondly, that there was no precedent for introducing rivalry with an existing gas company by a mortgage of the rates; thirdly, that the promoters had not conformed to the directions of the Secretary of State, and that their bill was liable to be stopped at any moment; and fourthly, that there was nothing in the conduct of the gas company to justify the present application. On all these grounds he trusted the committee would unanimously reject the bill.

The CHAIRMAN: Before you call any evidence I think we had better have the room cleared.

The room was accordingly cleared. After some time the parties were called in again.

The CHAIRMAN said the decision of the committee is that they cannot recommend the House to pass the Act confirming the provisional order.

The clauses and schedules relating to Stroud were ordered to be struck out of the bill, and the remaining clauses, with the amendments and alterations, were agreed to; and the chairman was directed to report the bill, as amended, to the House.

HOUSE OF COMMONS.

(Before Mr. STANSFIELD, *Chairman; Lord* STANHOPE, *Mr.* MORRISON, *and Mr.* YORKE.)

LIVERPOOL UNITED GAS BILL.

MONDAY, MAY 22.

Mr. CALVERT, Q.C., Mr. ASPINALL, Q.C., and Mr. ROBINSON, appeared for the promoters; Mr. MEREWETHER, Q.C., and Mr. MILWARD, Q.C., for the corporation of Liverpool; and Serjeant ATKINSON for the Guardian Society and the Tradesmen's Guild of Liverpool, petitioners against the bill.

Mr. CALVERT in opening the case for the promoters, said the bill which he had the honour to submit to the committee was a bill "to authorize the Liverpool United Gaslight Company to increase their capital, and to purchase additional lands, and for other purposes. The district for which it was proposed to increase the means of supplying gas consisted of the borough and suburbs of Liverpool, and he might state at once that it was not proposed to increase those limits at all. It was proposed to put some of the works in the suburbs, but that was simply because the promoters could procure land there better than they could do in the more thickly populated parts of the district. In order to give the committee some idea of how much the consumption of gas had increased in Liverpool, he would state that in the year 1848, the consumption was 436,697,000 cubic feet. This enormous quantity was manufactured at four works, two of which had belonged to a company formerly existing in the town, called the Liverpool Gaslight Company, the other two belonging to a company called the Liverpool New Gaslight and Coke Company. At that time the price of gas was 4s. 6d. per 1000. These two companies were amalgamated and incorporated as one company in 1848. In the year 1864 the consumption of gas had increased to 1,149,540,000. The only addition which had taken place in the works was the creation of a station at Wavertree, in substitution for one which formerly existed in Dale Street. The price of gas in the interval between 1848 and 1864 had been so much reduced, that at the latter period it was charged at the rate of 3s. 2d. in the borough, and 3s. 6d. in the outlying parts of the district, where the distribution was of course attended with greater expense to the company. The figures which he had given showed that the increase in the consumption between 1848 and 1864 was at the rate of 163 per cent. Latterly the per centage of increase had been even greater than in those years, the increase in 1864 being at the rate of 11¾ per cent. above that of 1863. The town and suburbs of Liverpool had greatly extended in population, and therefore the number of objects to which gas was applied was immensely extending also. During the next ten years it was fully expected that the demands upon the company's resources would be double that of the present time. This showed to a certain extent how much it was necessary to do to meet the wants of the town. Estimating the probable increased consumption at the rate only of 8 per cent. per annum, the quantity of gas required, which now stood at 1,149,500,000 cubic feet, would be in 1873 no less than 2,098,000,000, or nearly 3,000,000,000 cubic feet. This quantity very far exceeded the present capability of the company's works. The limits of their capacity at the present time was 6,000,000 cubic feet per day; the estimate which he had given of the probable demand in 1873 was at the rate of 10,400,000 cubic feet per diem, to which must be added 15 per cent. for the purpose of meeting contingencies, making a total daily requirement of 11,960,000 cubic feet, or as nearly as possible double the present capacity of the works. He believed, too, that he was justified in saying that these figures were rather under than over the mark. In order to meet the demand and to provide works adequate to the future necessities of Liverpool, the company had at command the sum of £58,000 and no more, and it was considered by them that at least £300,000 more would be required. So convinced were they of the necessity for obtaining additional powers and using them in providing fresh works, that they had already contracted for land in the name of trustees, as they were anxious to prevent the possibility of their having to pay an increased price for the same, and they were prohibited by a clause in their present Act from holding more than 28 acres. The consequence of the step they had taken was, that if the committee passed the present bill, the company would be able at once to avail themselves of this arrangement. In the bill there was a provision for increasing the remuneration of the directors.

Serjeant ATKINSON said that was a very short point, and one which in reality had been already settled in the House of Lords.

Mr. CALVERT said the great question was as to how the company should raise the necessary funds for the purpose of enlarging the works. That being the case, it was incumbent on him to show how their finances at present stood. There was, as he had stated, an Act passed in 1848 for the amalgamation of the two then existing gas companies, and the plan of that Act was to leave the combined company in possession of the powers and finances of their predecessors, exactly as they stood at the time the bill was introduced. The Liverpool Gaslight Company, which was the older company, had a capital of £225,000, and power to raise further money, by sale of shares, to the amount of £159,837. The Liverpool New Gaslight and Coke Company had a capital of £198,750, with power to raise an additional £55,250. Adding the two existing capitals together, there was a sum of £423,750 already raised, with a power of raising £215,087 in addition. In accordance with the above-mentioned powers, the Liverpool United Gas Company had now increased their capital from £423,750 to £529,900 by the creation of new shares, a portion of which had been sold to the public in pursuance of a clause in the Act of 1848. In addition to the sum of £529,900, which was the nominal value of those shares, there had been realized two sums by way of premium upon the sale of them, amounting to £69,213 and £82,157, making together £681,270. The company were limited as to dividend to 10 per cent., which was payable upon the £529,900 only. Applying that rate of dividend, however, to the whole sum of £681,270, which had been expended on the works, it gave a return of only 7·70 per cent. That was the result of the state of things at the present time, and he might inform the committee that the amalgamation had worked most beneficially to the public. The price of gas, as he had mentioned, had been reduced from 4s. 6d. to 3s. 2d. since that time, and there was an entire absence of complaints of any kind, either as to the quantity or quality of the gas supplied, or the way in which the works of the company were conducted. Indeed, he believed, they might take their character from their opponents, to whom they could appeal as to the fact that their gas was uniformly good, that the supply was abundant, and that it was charged at a cheap rate; the cheapest rate, in truth, of that supplied by any company in the kingdom. They therefore came before the committee as a company with the best possible character, asking to be enabled so to increase their resources as to be in a position to meet the demand for gas which the present circumstances of Liverpool made upon them, and the probable future increase in that demand for some years to come. In this bill there were two petitions appeared upon. In character these two petitions were as nearly the same as possible; and he thought that when dealing with one, he might be considered, practically, as dealing with both. The first was the petition of the mayor, aldermen, and burgesses of Liverpool; the other was the petition of the Guardian Society for the Protection of Trade and others. The first allegation in the former petition was to the effect that the promoters of the present bill were the only company supplying gas within the borough, and was constituted by the amalgamation of two separate companies, which were dissolved and reincorporated by the name which the company now bore—"The Liverpool United Gaslight Company." The committee would observe, therefore, that the same principle had been adopted in Liverpool which had been carried out in the metropolis—viz., that of fixing the limits of the gas company's supply, and preventing competition therein. The petition proceeded to set out that by the Act of incorporation and amalgamation the existing and further capital of the company, both by shares and by borrowing, was limited and defined; that the existing share capital was declared to be the then aggregate of the capital of the dissolved company, amounting to £423,750, and the new share capital £215,087, making a total of £638,837; and that their existing borrowed capital was £34,800, and their further borrowing powers £65,200, making a total with the share capital of £738,837. It further stated that by the same Act the maximum dividend which the company were empowered to pay upon their authorized share capital of £638,837 was fixed at 10 per cent., after payment of which, and after setting aside a sum not exceeding 3 per cent. on their capital for the time being, for the purpose of forming a sinking-fund, the company were required to reduce the price charged by them for gas, their maximum price being fixed at 4s. 6d. per 1000. The committee had already heard from him that this 10 per cent., if applied to the total capital invested in the undertaking, amounted only to 7·70 per cent. The petitioners stated further that "by the said Act the company were specially restrained from converting any portion of their mortgage debt into shares, so that the total amount of capital upon which a 10 per cent. dividend could be paid was limited to £638,837." The next allegation was: "That by the said Act the company were also required to sell by public auction, in the manner therein prescribed, a definite proportion of the new shares to be created in reference to such new capital before dividing any such shares among themselves, and any premium arising from the shares so sold is, by the Act, directed to be exclusively appropriated to extending and improving the works, and is not to bear any dividend." Now, this had nothing to do with the Act of 1848. That Act accepted the financial arrangements which had been made with respect to the two pre-existing companies, and transferred their liabilities and their powers exactly as they stood. In the year 1847 a company was started in Liverpool called "The Guardian Gas Company." That company came before Parliament and was opposed by the then "Liverpool Gaslight Company." In the course of the discussions which took place before the committee to whom the bill was referred, divers propositions were made upon different sides, and at last, it being a very great object with the Liverpool Gaslight Company that the Guardian Company should not obtain their bill, a satisfactory arrangement was entered into. The offer which the Guardian Company came forward with on that occasion was, to charge 3s. 8d., per 1000 feet for gas: the Liverpool Gaslight Company at that time, charging, and by no means thriving upon, the price of 4s. 6d. The committee had heard to day, that the Liverpool United Gas Company, were now charging 3s. 2d., and 3s. 6d. Of course there had been a long interval between 1848 and 1864, and the improvements which had taken place in the production of gas, had aided the amalgamated company in reducing their price. But in 1848, the then existing company considered that they should be ruined if they were obliged to reduce their price to the extent proposed, and they therefore came to terms with the Guardian Company, who withdrew from the contest, some of their members being put upon the direction of the old company, who undertook to allow this £159,837 worth of shares to be put up for sale, the object being that persons who were shareholders in the Guardian Company might become shareholders in the Liverpool Gaslight Company. That was the great object for which they came forward, and having obtained this, they were satisfied. It was therefore a mistake to suppose that the Act of 1848 had anything to do with the ques-

tion of the sale of shares; that was merely the effect of an arrangement between the parties at the time. The petition went on to state "That the further capital was to be raised in the following manner, namely:—They were empowered to raise £55,250, being the amount which one of the dissolved companies was by its Acts empowered to raise, by shares of £25 each, of which shares, before offering any to the proprietors of the company, they were to sell 940 to the public in lots of not more that four shares each, all premiums arising thereon being applicable to the improvement and extension of the works, but dividend being only paid on the nominal sum of £25 per share: and the company were empowered to dispose of the remaining 1270 shares among the then proprietors of shares in one of the old companies, as directed by the said Act. The company were also empowered to raise the further capital of £159,837, being the amount which the other of the dissolved companies was by its Act empowered to raise by the principal money and premiums arising from the sale of a sufficient number of shares of £25 each for the purpose, in lots of not more than four shares each, all the premiums being dealt with in the same manner as the premiums on the 940 shares, and the dividend to be paid only in respect of the £25 capital money. That a large proportion of such shares have been so sold and have produced by public auction large premiums, and such premiums have been expended by the company in extending their works to the great benefit of the consumers, inasmuch as no dividend is payable upon the amount realized by such premiums. That the company have thus raised of their additional capital of £215,087—consisting of the said sum of £55,250 and £159,837—the sum of £156,809, leaving the sum of £58,278 still to be raised; and they have borrowed to the aggregate amount of £80,000, leaving the sum of £20,000 still to be borrowed; so that the company have at the present time unexercised powers of raising money to the extent of £78,278. The committee would find that this was a mistake, for the £20,000 had also been borrowed.

The CHAIRMAN: In the preamble of the bill it is stated that of the £100,000 which the company are authorized to borrow, £80,000 only have been raised in that way.

Mr. CALVERT said the remaining £20,000 had been borrowed since the date of the bill. The committee would find, when they came to the consideration of finance, that this was the fact; so that, as he before stated, the company had now only £58,000 at command. The petitioners then stated "that notwithstanding the existence of such unexercised powers, the company, by the bill before your honourable House, seek power to raise a further capital in shares to the extent of £300,000, and to borrow to a further extent of £60,000. That such additional capital is not now required for the purposes of the company, and there is no reasonable ground for supposing that it will ever be required to the full amount proposed to be raised." Of course that would depend upon the promoters substantiating the expenditure which he should have to lay before the committee, "and such further expenditure as may become necessary will be for the extension of the company's supply beyond the limits of the said borough, and probably in a district which will be little remunerative to the company. He had already stated that the company did not propose to extend the limits within which they were at present authorized to supply gas. "While, therefore, the company are seeking largely to increase their capital for purposes from which neither your petitioners, as large consumers of the gas of the company, nor the inhabitants of the said borough, whom your petitioners represent, will derive any benefit, your petitioners and the said inhabitants will have to submit to an indefinite postponement of the time at which, under their existing Act, the company will be required to reduce the price charged by them for gas; inasmuch as the company will not be compellable to make such reduction until they have paid dividends upon such additional capital, as well as the prescribed dividend on their authorized capital." It was the duty of the company to see that they had enough gas for all the inhabitants; and, no doubt, there was a certain amount of risk in making the proposed increase, but the company were themselves the persons who would have to bear that risk. One of the collateral circumstances was that mentioned by the petitioners, but the company would be very much wanting in their duty if they, feeling that the town of Liverpool required a large increase in the supply of gas, did not ask for the necessary powers. On the one hand there was the prospect of a postponement of the time when a reduction of price would be possible, on the other there was the risk of the company not having a sufficient supply of gas. As far as they themselves were concerned, the company would be disposed to stand as they were, but having regard to the exigencies of their district, they felt bound to come before the committee. "That your petitioners therefore object to power being granted to the company to raise additional capital as proposed by the said bill"—but the committee he was sure would be convinced, on hearing the evidence, that the company ought to be allowed to raise money sufficient for the next ten years at least. "That, should your honourable House be of opinion that further powers for raising money should be granted, then your petitioners submit that the amount should be far less than that proposed by the said bill; that the company should be restrained from capitalizing this borrowed money; and that (as provided by the company's existing Act) a due proportion of the shares created for raising any additional capital should be offered to the public instead of being divided amongst the existing shareholders, any premiums arising from such sale being applied in extending and improving the works of the company and not bearing dividend." Now this might have been all very well if the company had been allowed to divide amongst themselves a certain portion of the shares at 10 per cent., but the committee would find that the whole they could divide was 7 per cent., an amount of interest which he was sure they would agree with him was not too much to be allowed to the company for raising this additional capital. Supposing a new company were to come forward to supply Liverpool with gas, they would no doubt obtain the usual power with regard to dividend—viz., a right to divide 10 per cent. Every new company were allowed 10 per cent., but when an established company came forward to increase their capital, Parliament fixed it at something less, for this reason, that they were already secured to a certain portion of their undertaking. The Imperial Gas Company had this year obtained power to raise £1,300,000 at 7½ per cent., and therefore the committee would not think it unreasonable if this company had, not 10 per cent. allowed them, but only 7 per cent., that the existing shareholders should have the option of taking up the new capital. "Your petitioners further submit that if the said bill be passed into a law it should be distinctly enacted therein that the company shall not be entitled to make any higher charges for the supply of gas than those prescribed in the recited Act; that the amount which the company may set aside as a reserved fund should be clearly defined; and that all the provisions contained in that Act in reference to the reduction of the price of gas under the circumstances therein detailed, and to the examination of the accounts of the company by a competent person appointed by the recorder of the borough, and his power to make compulsory reduction in the events by the same Act prescribed, should extend to the capital authorized to be raised by the intended Act and the works connected therewith." These were all matters affecting, not the preamble of the bill, but the clauses, and could be discussed hereafter. "That the said bill contains provisions with the professed object of securing the purity of the gas supplied by the company; but your petitioners submit that such provisions are wholly insufficient for securing that object, and ought, if the said bill is to pass, to be extended and amended, and that the limit of impurity of the gas so supplied ought to be defined by the Act, and that the corporation should be at liberty to test the gas from the supply to be furnished by the company to the public lamps under the control of the corporation whenever they may consider it necessary so to do." The question of the testing of the gas was also a matter of clauses, with which, at present, they had nothing to do, and therefore he would not trouble the committee upon it. "That the company by the said bill seek power to acquire, in addition to 28 acres which they are at present empowered to hold, certain lands specified in the schedule to the bill; but your petitioners submit that such additional lands are not required for the purposes of the company, and that, in any event, the power to acquire the same should not be conferred on the company without inquiry being made as to the circumstances under which and the purposes for which the company acquired the lands now held by them, some of which are not used for the purposes of their undertaking." All he could say on this point was that there was nothing with regard to the land, works, or supply of gas, which the promoters were not perfectly prepared to lay before the committee, and they felt convinced that the committee would be of opinion that the land they had now got was land that they had a right to and were using for right purposes; and that they should be able to establish a claim to confidence on the part of the committee that whatever additional land they might acquire would be used to the best purpose. The preamble of the bill, which he would now read, fully bore out the statements he had made in opening the case for the promoters, and he hoped when those statements were supported by evidence the committee would have no hesitation in declaring the preamble of the bill to be proved.

Alfred King, Esq., examined by Mr. ROBINSON.

I am a civil engineer, and have been the engineer of the Liverpool United Gas Company since the amalgamation took place. Previous to that I was the engineer of the Liverpool Gaslight Company. Altogether I have been connected with gas-works in Liverpool for 39 years. I have prepared a statement showing the amount of gas supplied by the company in 1848 and subsequent years. [Document handed to the committee.]

Mr. MEREWETHER: I do not think this point need occupy much of our time.

Mr. ROBINSON: I believe not. The only object is to show the rapid increase that has taken place.

The CHAIRMAN: If the matter is not one of much importance to the inquiry, the shorter we take it the better.

Mr. ROBINSON: We wish to satisfy the committee that the annual increase in the supply of gas is between 10 and 11 per cent.

The CHAIRMAN: That may be taken for granted.

Examination continued: A very large proportion—nine-tenths of the whole increase—has been in the town proper, or within the municipal borough. The present works are capable of supplying 6½ million cubic feet per diem. Assuming that the increase in the next ten years is at the same rate as at present the required supply will be about double what it is now. We have four works in different parts of the town. They are the same works that we had in 1848, except those at Wavertree, which have been subsequently erected in substitution of others which were in the very centre of the town, and which we destroyed. The works are adequate to the existing demand for gas, but they will not admit of a considerable increase. We have secured two advisable sites for erecting new works upon. [The position of the sites was pointed out on the map.] One is at the extreme north and the other at the extreme south of the district. They are excellent sites and contain 10 acres each. One is on the banks of the canal, the other is at Garston. I have made an estimate of the cost of the proposed works. I consider that the sum of £334,050 will enable us to double the present capacity of our works.

Mr. ROBINSON: I do not know whether my learned friends raise any question as to the quality of the gas supplied by the company, but perhaps you will tell the committee whether you have had any complaints on the subject?

Witness: No; the gas is perfectly good. If a certain amount of light were obtainable in London at a cost of 5*s*., the same amount could be had from the gas in Liverpool for 2*o*s., taking price and quality together. The difficulty we have at the present time is to resist the applications for extensions into districts which are not within the range of our pipes. There is hardly a good mansion in the neighbourhood of Liverpool but what is lighted all over with gas, wherever it is possible to obtain it. The corporation test the gas, but there is no officer appointed for the purpose.

The CHAIRMAN: How is it these questions were not gone into before the referees?

Mr. ROBINSON: That I believe is for my friend to answer.

Serjeant ATKINSON: We make no point about this; my friend may take it as shortly as he pleases. We shall not raise any questions.

The CHAIRMAN: I think you raise the question about the testing in your petition.

Mr. MEREWETHER: With the present quality we are quite content, but we fancy we see in the bill certain things which might lead in future to a relaxation in reference to the present good quality; that, however, will be a matter of clauses.

The CHAIRMAN: Then as to the mode of testing the purity and illuminating power, you propose to ask no questions?

Mr. MEREWETHER: Supposing you pass the preamble, we might ask to bring up a clause about that.

The CHAIRMAN: But is not that a question for the referees?

Mr. ROBINSON: Clearly it is.

Mr. MEREWETHER: The referees have been very uncertain in their proceedings in these matters.

The CHAIRMAN: Well, we can discuss it when we come to clauses.

Mr. MEREWETHER: There is a very short point in this case, if my friend will keep to it; it is the question of capital.

Examination continued: At the time of the amalgamation the share capital was £423,750. Since that time the company have raised £156,807. In 1864 the amount was £529,500. The amount borrowed has varied very much. Our powers of borrowing being limited to £100,000, sometimes a large proportion was borrowed and then paid off. At present the whole amount is raised, and it has been so on previous occasions. The dividend which the company now pay, taking into account the whole amount of capital called up, with the premiums, is about 7½ per cent. From 1845 to

1855 the price of gas was 4s. 6d. per 1000; from 1855 to 1858 it was 4s. in the borough and 4s. 6d. in the rural districts; from 1858 to 1862 it was 3s. 9d. in the borough and 4s. 3d. in the rural districts; in 1862 and 1863 it was 3s. 7d. in the borough and 4s. outside; in 1864 it was 3s. 5d. within the borough and 3s. 9d. outside; and at the present time it is 3s. 2d. in the borough and 3s. 6d. outside. All these reductions have been made by the directors voluntarily, under the operations of the Gas-Works Clauses Act. I remember the circumstance of the amalgamation. In 1847 there were two companies before Parliament—the old company, which I represented, and a new company promoted by the Guardian Society of Liverpool, called the Guardian Gas Company. The latter proposed to supply gas at less price than it was being sold by the old company. They had been before Parliament in 1845, and were defeated. I think the price they proposed in 1845 was a maximum of 4s. 6d., and when they renewed their application, in 1847, it was reduced to 3s. 8d. The committee having heard the case of the old company, who were there for the purpose of an amalgamation bill, said they would not decide upon the preamble until they had heard the case of the Guardian Company. They accordingly heard the case to the close of their evidence; they did not hear us in opposition, but requested an interview with both parties, when they said the Guardian Company had made a strong impression upon the committee. The engineer of that company was the patentee of a new process for making gas, by which process a large saving was to be effected in this way:—In the ordinary mode of making gas one-half of the coke is destroyed in heating the retorts, and consequently there is so much loss of a valuable product. Mr. Cox proposed under his patent to save all this expenditure of fuel by heating the retorts with the waste heat of the coke-ovens, so that while, on the one hand, there was a saving in the way of fuel, he was to have produced in the retorts a valuable coke for railway purposes. Had that patent been founded upon solid and true principles, there might have been a saving in the cost of gas, but it was a fallacy altogether. The thing was never heard of from that day to this; but it was on that ground that their price of 3s. 8d. was justified before Parliament at that time. The committee told us, "You must bid a high price, for these gentlemen have produced an impression upon our minds, their evidence being supported by that eminent chemist, Mr. Herepath, of Bristol." The bidding high was that we should pay the sum of £4000 for the expenses of the Guardian Company. The bargain was that we should pay that, and that we were to submit to have our new capital raised by shares, which were to be sold by auction instead of being distributed among the shareholders. We were seeking to raise £200,000 at that time, and the Guardian Company the same. Parliament said they would not take away our monopoly if we would distribute that £200,000 among the public. We were obliged to take any terms that were offered—on these terms the bill of the other company was withdrawn.

Cross-examined by Mr. MEREWETHER: I do not know that the committee in 1847 suggested amalgamation; it had been talked of some time previously. It was suggested by the committee in 1845. From 1843 to 1848, this gas question was constantly agitated in Liverpool. Recent sales of shares in the Liverpool United Gas Company have realized £100 prem.; there may have been shares sold at £104 or £108 prem. They are bought to pay 5 per cent. upon the purchase money. When the electric light was first introduced, the price ran down to £120. The public have recently been content to buy them to pay 5 per cent. interest. The present area of our land is 20 acres. We now apply for power to purchase more, so as ultimately to make it up to 60 acres. We have found the great inconvenience of being confined within narrow limits, as we must be when we have to pay 30s. per square yard for land. We expect to get it at 3s. It is quite true if you want me to justify the whole extra acreage asked for, I cannot do it. I only say the probability is we shall want it some time or other. We do immediately want the 40 acres, and we may ultimately want 60.

By Serjeant ATKINSON: In Liverpool gas is used very extensively in private dwellings. It is used a great deal by the working classes. That is the consequence of our supplying a good quality, and at a low price. I have no classified account to show the proportion in which gas is used in shops and private dwellings, but I may mention that we have 23,000 consumers who do not pay us £2 each per annum. We have had a surplus profit year by year, and we have been enabled to reduce the price of gas in consequence. We have a reserve-fund of £60,000. The Gas-Works Clauses Act allows of a reserve equal to 10 per cent. upon the capital of the company, but our Act limits us to 3 per cent. The accounts of last year show a large sum for repairing meters, and also the accounts of 1863. It may be that that includes something more than repairs. There was once a large sum placed to deterioration of meters to meet the wear and tear going on. I think we committed an error in not making that charge earlier; but I suppose we do as most prudent people do, make those charges when we can best afford it. This item was not charged so much in any previous year. [Witness was asked several questions respecting other items in the last year's accounts.] I think it right to inform the committee that, singularly enough, we are the only company that has come under the operation of the Gas-Works Clause Act, by which the recorder has the power of appointing an accountant to examine the accounts of a gas company. Our accounts have been annually examined and reported upon. During the year in which there was so large an outlay as £20,000 for necessary repairs, the price of gas was reduced from 3s. 9d. and 4s. 3d. to 3s. 7d. and 4s.

Re-examined by Mr. ROBINSON: In 1847 there were only two companies promoting bills before Parliament. The third company was there for the purpose of opposing the Guardian Company.

Serjeant ATKINSON: They were all before Parliament and parties to the contract, as I shall show.

The CHAIRMAN: I think you said the amalgamation was suggested by the committee?

Witness: That was in 1845, when the Guardian Company was first before them. Neither of the existing companies were before Parliament then, and the committee said they had no power to enforce such an arrangement upon them.

Mr. MEREWETHER: But they said if an amalgamation could not be arranged they would go on with the bill of the Guardian Company.

Witness: No; that was in 1847.

Mr. ROBINSON: It was in 1845 that the amalgamation was suggested; there is no evidence of its being suggested in 1847.

Re-examination continued: The price of the shares has varied very much in the last ten years. The accounts of the company are before the recorder every year, and they are filed.

Thomas Hawksley, Esq., examined by Mr. ROBINSON.

I am acquainted with the Liverpool Gas-Works, and have been engaged for the company for the last 25 years in parliamentary business. I have recently made an inspection of the works.

Mr. ROBINSON: Have you made a calculation of what they are capable of producing at the present time?

Serjeant ATKINSON: We have made no point of this.

Witness: They are capable of making about 6 million cubic feet of gas per diem—between 6 and 7 millions when all the retors upon the ground are in use; but there are always a number of retorts broken up.

Mr. ROBINSON: Have you formed any estimate of the value of the works?

Mr. MEREWETHER: We are not contesting the value of the works. What bearing can this have upon the question before the committee?

Mr. ROBINSON: It has a material bearing. We are asking Parliament for power to raise further sums of money, and we ought to show that the capital up to the present time has been fairly and properly invested, and is fully represented by the existing works.

Serjeant ATKINSON: The short issue between us is as to the mode of raising the money.

The CHAIRMAN: I think it is clearly understood that the sole issue is, as to the mode of raising the additional capital.

Mr. MEREWETHER: That is really the point. If the money be properly raised we have no doubt that it will be well expended. What we contest is the mode of doing it; by which so much will be put into the pockets of the shareholders.

Mr. ROBINSON: Do you state that this is not a proper amount to raise?

Mr. MEREWETHER: No.

Mr. ROBINSON: If you concede the point that power should be given us to raise £300,000, that is enough.

Serjeant ATKINSON: There has been no cross-examination of Mr. King on that point.

The CHAIRMAN: The statement of the opponents counsel is perfectly clear, that the objection is as to the mode of raising it. The question on the preamble is as to the terms upon which the additional capital shall be raised.

Mr. MEREWETHER: They may take power to raise £300,000. I dare say they will not raise the whole unless it is necessary.

Mr. ROBINSON: If Serjeant Atkinson says the same, that is enough. His is an independent opposition.

Serjeant ATKINSON: I do.

Mr. ROBINSON: If the point of raising the amount is conceded, the question will be very limited.

The CHAIRMAN: I do not think it is conceded.

Mr. ROBINSON: The committee will see that under the Joint-Stock Act of 1862 every company in the kingdom is now given an absolute power of purchasing any amount of land.

Mr. MEREWETHER (after consulting with his clients) said he had no doubt when they came to clauses they would hear nothing more about the point just raised.

Examination continued: I am of opinion, from an examination of the works of the company, that they certainly require more land. They are working now at very great disadvantage in consequence of not having sufficient land on which to store their coke and coal. They are obliged to get rid of the coke most disadvantageously at reduced prices. The fact is, that under favourable circumstances a company cannot manufacture more than 250,000 feet of gas per day upon an acre of land, even in large works. The proposed new works will enable this company to manufacture about 12,000,000 cubic feet per day. They will then have about 48 acres.

Mr. MILWARD said, on the part of the corporation of Liverpool, if the company thought they wanted the additional land named in the schedule of the bill, he would not oppose it provided there was no temptation to expend money in unwise speculation. If they wanted it for the purposes of the gas-works he should not oppose it. But having conceded this, he thought he should have strong reason for saying that they ought to raise their money in a proper manner.

Mr. ROBINSON said the best guarantee the corporation could have was the way in which the company had conducted their works.

The CHAIRMAN (to Mr. Milward): If you stop their evidence you must accept their statements.

Mr. MILWARD: I do.

Serjeant ATKINSON: As far as the quantity of land is concerned.

Mr. ROBINSON (to witness): You have heard that the scheme to raise the money will pay the shareholders 7 per cent. Is that in your opinion a fair remuneration?

Mr. MEREWETHER: Before you answer that question, I should like to know whether the committee have transferred their authority to Mr. Hawksley?

Mr. ROBINSON (to witness): Well, is it usual?

Mr. MEREWETHER: To that I object. We do not know what the particular circumstances of each case are. Whatever Mr. Hawksley's views are, it is a matter of inquiry into the circumstances of each case.

The CHAIRMAN: Your argument is against the conclusiveness of the testimony.

Serjeant ATKINSON: They themselves ask for 7 per cent.

Witness: When the capital employed by a compay is fairly represented by the amount and extent of the existing works it is not; but in a great many cases there is an immense amount of deterioration, and works do not represent the existing capital. It is then necessary to draw in additional capital at a very low rate to restore the balance. But here the works do represent the amount of capital which the company have laid out. They are well kept up. I have been through them all, and I know from experience what the cost of gas-works such as these is. I know that they represent a value of £750,000. In many cases in which I have been concerned, works upon which £750,000 have been expended would not represent more than £600,000. I was engaged in this case in 1845, when the question was discussed before Parliament. I think the action taken in 1847 was rather carrying out the views expressed by the committee in 1845.

The CHAIRMAN: It was a kind of understanding that it should be carried out.

Witness: It was. There may be a mistake as to the two dates. In the first instance there was an opposition company, and Parliament thought it desirable to exact from the gas companies that they would reduce their price to 4s. 6d. as a maximum, and that they should undertake to amalgamate.

The CHAIRMAN: And raise additional capital by selling shares by auction?

Witness: No; that comes afterwards. At that time there was nothing of the kind said. The House of Commons, in 1847, was very much engaged, and shorthand writers were very scarce. As I could write shorthand, I was requested to take down the resolution of the committee, which I did, and that resolution went to the point I have mentioned, and a bill was

brought in in pursuance of that resolution. But the first resolution related to a reduction of price and the adoption of the principle of amalgamation in preference to competition.

Examination continued: Gas companies shares fluctuate in value. The price of coals affects them, and sometimes the liability of companies to competition; sometimes from mere alarm that gas may be manufactured in some other way, or be superseded. All these things operate to create fluctuations.

By the COMMITTEE: In some cases in my experience the price of coal has doubled. During the Crimean war the price of coal and of freights rose enormously. At times a turn out of colliers occurs and affects the price. And I may state generally that the price of coal all over the kingdom is gradually, but slowly, increasing. With regard to cannel, that in Lancashire will be worth double in a few years. The Liverpool Company make use of cannel exclusively. The present price is about 16s. The cost of making gas has increased in some cases by the rise in the price of coals as much as 8d. per 1000 feet. Labour also has increased in value. When the make reaches half a million cubic feet a day there is very little saving in the cost of manufacture. It does not amount to a farthing per 1000 feet. There is some saving in salaries. The quantity of gas produced per ton is about 10,000 manufactured and 9000 sold—the difference being from leakage and loss.

Mr. *Garnett*, examined by Mr. ROBINSON.

I am solicitor to the Liverpool United Gas Company. The company was formed by an amalgamation of two previously existing companies. The joint capital of these two companies at the time of the amalgamation was £423,000. The two old companies were the Liverpool Gaslight Company, which was founded in 1818, with a capital of £50,000, and the Liverpool New Gaslight and Coke Company, founded in 1823, with a capital of £40,000. From time to time these two companies had raised further capital for their respective undertakings. The new capital raised after the year 1847 was by the issue of a 10 per cent. bearing stock, one half of which was offered to the public and the other half was appropriated to the shareholders. The practical effect of that was to raise the money required for the purposes of the company, at an annual average charge of 7½ per cent. per annum. In the year 1847 the Gaslight Company went to Parliament for power to raise an additional capital of £200,000. In the same year the Guardian Gas Company applied for power to establish themselves in a portion of the same district that the old companies previously occupied, undertaking to supply gas at 3s. 8d. per 1000 feet. On that occasion, rather than subject themselves to competition which would have been ruinous, the Liverpool Gaslight Company consented to take the further capital which they were then applying for, upon the terms of offering it to the public.

By the CHAIRMAN: There had been an application by the Guardian Society to Parliament in 1845. The bill was thrown out, and the suggestion was made by the committee that the interests of the consumers of Liverpool would be better served by the two companies undertaking to reduce the price of gas to 4s. 6d., and to effect an amalgamation. Some difference of opinion existed between the two companies as to what sort of an amalgamation was intended. One thought that it was intended they should come to Parliament to unite the undertakings; the other, that it referred simply to working arrangements between them. The main recommendation, as to the reduction of price, took effect. The suggestion for the amalgamation of the two companies originated with the Commissioners of Paving, now the Health Committee of the corporation, in consequence of the great inconvenience caused by the frequent breaking up of the streets by the two companies for the purpose of relaying or repairing of their mains. That was in 1845; but nothing was done about it till 1847, when, upon a report made by their surveyor, the Health Committee recommended the corporation to promote the amalgamation by all the means in their power. On the resolution of the corporation being communicated to them, the two companies agreed to an amalgamation upon the terms embodied in the Act of 1848.

Cross-examined by Mr. MEREWETHER: The House of Commons committee suggested in 1845 that an amalgamation would be a desirable thing, for the sake of economizing capital; but nothing was done upon their recommendation except the making of a reduction in the price of gas.

This was the case for the promoters.

Mr. MEREWETHER said at the commencement of the inquiry he ventured to intimate to the committee that the subject for their consideration really lay in a nutshell. As far as he was concerned, he had endeavoured to save time by keeping the evidence within the narrowest limits; but his learned friend who opened the case for the promoters had put everything before the committee but that which was the real issue. He had insisted upon the good quality of the company's gas, which the opponents of the bill did not contest—upon how much the consumption had increased, which they were all aware of; in fact, he had dealt with every point but the one which really had to be decided. Now the controversy between the gas company and the corporation of Liverpool, as well as the consumers whom Serjeant Atkinson represented, was this:—The company were coming before Parliament for further capital, the opponents of the bill would not say that they did not want it; they were coming for further land, the opponents would not say they did not want it; the simple question was—granted that the company have to raise capital, how ought they to raise it? And on this point he would venture to ask the committee that they should require the company to adhere to the bargain which Parliament made with them when they got their last bill. It was all true that they had said; but there were two or three points which the corporation desired to supplement; that is to say, they insisted more than the company did, that at the time the last powers to raise capital were conferred upon them, there was a peremptory bargain between them to the Legislature as to the mode in which all their future capital should be raised. Mr. King's statement he fully assented to, that the principle of the bill of 1847 was, that all the shares should be sold by auction, and that it was upon those terms that they secured their monopoly—a monopoly which they had enjoyed ever since, which still existed, and which in all probability would continue to exist. At all events, he was quite sure that if a new company started in Liverpool to-morrow, the present gas company would at once plead the arrangements connected with the amalgamation of 1848 as a reason why the new company should not be incorporated. The corporation of Liverpool therefore respectfully asked the committee to administer even-handed justice, and to keep the company in their reciprocity to that bargain, and to require that any further capital they might raise should be raised upon the principle laid down by Parliament in 1847. He believed they were in a condition to show that the shares of the company had been sold at above 100 per cent., but he was content to take Mr. King's figures. The Liverpool public who were interested in the matter knew the value of the article, and were content to take the shares at a price which would give them 5 per cent. upon the outlay. Mr. Calvert intimated that the company ought to be allowed 7 per cent., because they could anywhere get 5 per cent. for their investments, and they were entitled to 2 per cent. for the viscissitudes of trade. The Liverpol public, when purchasing their shares, did not ask for that; they were content to have 5 per cent., and so gave 100 per cent. upon the nominal value of the shares. The best way of testing the viscissitudes of trade profits was to ascertain the price of the shares in the market. He would fain not call witnesses; but the committee would see that the great contention was that the arrangement for the sale of shares by auction was a parliamentary bargain, not with reference to the capital named in that bill, but to all future capital. If it were not so, then *cadit quæstio* as to the opposition of the corporation on this point. It would be necessary, therefore, to call a witness or two, in order to give an exact history of that matter. It was well known in Liverpool how it was brought about; and if the committee should be of opinion that that was the intent of the bargain, then they would make that bargain apply to the future. But it might occur to honourable members to ask, why need you Liverpool people be interested in the matter? and they might require that the opponents of the bill should give some practical ground to show the interest they had in it. He could do that in a very simple manner. The capital of the company, by the Act of 1847, was entitled to a 10 per cent. dividend. The company were now asking for 7 per cent., and apparently they were thereby inflicting no injury upon Liverpool. But take the £300,000 proposed to be raised by the bill; if that were done on the old arrangement of a 10 per cent. dividend, and by the sale of shares, it would be only necessary for the company to issue £150,000 worth, 10 per cent. upon which £150,000 would be £15,000 a year. Withdraw the old arrangement, and issue the whole £300,000 at 7 per cent., that would be £21,000 a year; so that Liverpool would be at once the loser of £6000 per annum. That, of course, was a tangible and very important interest to those whom the corporation represented, viz., the consumers of gas in the town. In appearing before the committee now, they asked for nothing new, but simply that the terms upon which the company got their monopoly should be upheld. The Legislature had always been looking to see that care was taken by the gas consumers of Liverpool, and when new schemes had been originated, Parliament uniformly said to the company, you must come to terms of arrangement with them, or we will go on with the bill. If that had been the uniform principle in this matter, upon what pretence did the company now come before this tribunal and ask to have the bargain altered which had been attended with such results as he had shown? He asked the committee that in this matter so large a pecuniary advantage as they sought should not be put into the pockets of the shareholders of this company, but that the rights of the consumers should be protected in accordance with the bargain referred to.

The CHAIRMAN: You rest your opposition entirely on the ground that it was a bargain in 1847?

Mr. MEREWETHER: Entirely.

Mr. CALVERT said he understood the differences between the parties were reduced to the sole question of how the capital should be raised. That was no part of the preamble, it was a matter of clause. The committee being of opinion that the works should be done, and the money raised, might pass the preamble which contained nothing defining the mode of raising the money. It would be more convenient to fight that battle when they came to clauses.

Mr. MILWARD objected to such a course. The preamble certainly referred to the question of capital, for it alleged that "it is expedient the company should be authorized to raise additional funds." This implied the mode afterwards referred to, and he should say, upon the principle which his learned friend now put, he should object to their raising capital altogether. He was there to oppose the preamble of the bill, and to say that it was not necessary to raise capital in that way.

Mr. CALVERT said the promoters alleged that "the amount of capital and moneys authorized to be raised and borrowed under the said Act has been found insufficient for the proper and efficient supply of the said district with gas." Did the opponents say that this was incorrect? If so, then he was prepared to fight the battle at once. The promoters alleged that "it is expedient the company should be authorized to raise additional funds for such purpose." Was this denied? It was not said in the preamble how the money so authorized should be raised, so that by passing the preamble he did not see that the opponents were compromised in the least. If the committee were of opinion that the money should be raised, they were with the promoters on the preamble.

The CHAIRMAN said he not think the admissions made by counsel for the petitioners for the sake of saving time went so far as Mr. Calvert assumed. The case had better proceed.

Mr. *Jeffery*, examined by Mr. MILWARD.

I have resided in Liverpool for many years, and carry on a large business there. I am a magistrate of the borough and of the county, and a member of the Town Council. I have one of the largest business houses in the town, and am a consumer of gas. For twenty years I have taken an active interest in the question of the gas supply. I remember the discussions which took place in 1842. At that time there were two companies in the town, and it was said that we had a wholesome competition, but I believe it was not so.

The COMMITTEE: Have you any authority for saying "it was said"?

Witness: There were many complaints, and it was a matter of fact which came before my notice that the Guardian Society received complaints from consumers that if they wanted to be supplied by the other company, some information was required why they had left the company which had been supplying them; so that *prima facie* there was an arrangement between the companies which was supposed to be prejudicial to the consumers.

By Mr. MILWARD: In 1843 there was a competition company got up but in consequence of not having conformed to the Standing Orders, their bill did not reach the committee. In 1841 one of the old companies had obtained a bill, and their price was then 7s. per 1000. In 1844 the other old company obtained a bill, and the price then was 6s. In 1844, when the consumers company were before Parliament, it was required that one-half of the shares should be sold, and no dividend paid upon the premiums realized. In 1845, when the old company were before Parliament seeking powers to increase their capital, the Guardian Company were seeking powers for existence. The old company at that time had reduced their price to 5s., which it was supposed was caused by the Guardian Company preparing to prosecute their bill. Before the Guardian Company had proceeded to call their witnesses the committee expressed it as their opinion that the interests of the consumers would be better promoted by an amalgamation of the two old companies and a reduction of price to 4s. 6d. on the 1st January following. Upon the companies consenting to conform to that, and to deposit at the town-hall a promise that the gas should be reduced, the Guardian Gas Bill was thrown out. The company seeking to raise capital were required to do so, by selling one-half of their shares, the

premiums not to bear interest, and the other half to be appropriated among their shareholders. It was expected the two companies would apply next session for a bill, but they did not do so. I believe the committee said, that if the amalgamation were not brought about between the existing companies, they should be prepared to go on with the bill of the Guardian Company. There was great disappointment that there was no amalgamation, as we considered it was an understood matter. In 1847 we applied the third time for a "Guardian Gas Bill." At the same time, one of the old companies was applying for an increase of £200,000 in their capital. This was not the same company that we met before—it was the Gaslight Company. At that time the corporation had taken the supply of water into their own hands, and there was a great deal of discussion in the town as to their also taking to the gas, which it was the opinion of many was very desirable. The capital of the old gas company was to be raised by selling the shares by auction. The committee before whom the Guardian Bill came said it was better for the consumers that there should be only one company, and they prepared a resolution to submit to the old company; and they said, if it was not adopted, they should decare the Guardian Gas Bill proved. The old company accepted the clause, and the Guardian Company were compelled to withdraw their bill. I believe at that time Parliament intended that the companies when amalgamated should become a consumers company; that all their extensions should be made by capital raised in the market at market price, which would secure to the company a monopoly, and to the public the advantage of only one line of pipes, and one capital upon which interest would be paid—that interest being at the market value of the money. The promoters of the Guardian Company had secured contracts from the consumers to take so much gas, which they said in their bill was the basis of their calculation to supply it at 3s. 8d. With one or two exceptions the shareholders were all gas consumers within the borough boundary. The bill brought into Parliament by the old companies in 1848 was a consolidation bill; it gave no new powers to them. It was the result of a bargain which had been come to in the course of the previous examinations, and to secure what parliament was most anxious to secure—that is, peace among the inhabitants. We had been in turmoil upon this question almost since the year 1834—since 1841, certainly. From 1848 to the present day, everything has been satisfactorily done to the interest of the company, and to the interest of the consumers. We considered that the arrangement then made was not for the moment only, but for the future. The consumers are most wishful not to disturb that Act of Parliament. Having been in operation 17 years, they are so favourable to it they wish it to be kept in perpetuity. The effect of the present bill would be to disturb the arrangement; and if it is passed, Parliament will be troubled next year with an application for a new company, as the public will consider it a breach of faith. The public have manifested a growing confidence in this undertaking, as is shown by the increased premiums realized on every subsequent sale of shares. I have no doubt the new capital could be raised at less than 5 per cent., judging from the last quotation.

By Serjeant ATKINSON: I remember the new company coming in, in 1843, to raise a capital of £127,000. The bill passed through the Commons; it was opposed by the Guardian Society in the Lords; and I think the company withdrew their bill because of some clauses being thrust upon them which were not acceptable. I think the new shares now sought to be created should be offered to to the public.

Cross-examined by Mr. ROBINSON: The maximum dividend which our consumers company asked for in 1847 was 7½ per cent. In 1847, I believe certain propositions were made to the gas company. We were taken very much by surprise when, after the evidence of our engineer—which the opponents had failed to shake in any important point—Mr. Wm. Brown, one of the members for South Lancashire, left the committee to mediate between the Guardian Company and the two old companies. Mr. Brown said the committee were very strongly of opinion there should be only one line of pipes in the streets, provided they could protect the interests of the consumers, and that if they saw their way clear to that they would declare the preamble of our bill not proved, provided the other company would accept their terms. If they would not do so they were prepared to give us our bill, and I think he said, the other parties theirs also. I am not aware that in that year there was a report made to the Commissioners of Woods and Forests on the Liverpool Gas Bill, nor whether in 1847 the Guardian Society were negotiating to obtain half the capital of the new company. I have some recollection of a proposition being made that the consumers should be represented on the direction of any company which should have a monopoly—either that two directors of the Guardian Society or two members of the corporation should be represented on the board.

Re-examined by Mr. MILWARD: I think Mr. King was under an erroneous impression when he said Parliament granted £4000 for payment of the expenses of the Guardian Society, but the company paid £600. My impression is, that the question was asked as to what our expenses were; it was difficult for us to say, but as were requested to fix a sum we said £600, which scarcely covered them.

Mr. *Evans*, examined by Mr. MILWARD.

For many years I have been in pratice as a solicitor at Liverpool. I was solicitor for the Guardian Gas Company, and for more than 20 years have been solicitor for the Guardian Society of Liverpool. The legislation of 1848 was the result of negotiations and terms come to in previous discussions. It was understood by our party to be a final settlement of all matters and for the government of future times. I endorse what Mr. Jeffrey has said, and my experience goes further back than his. So far back as 1834 the principle of selling the shares was established, and it followed in all legislation since then, a portion being given to the public and a portion to the company, until 1847, and then the whole was given to the public. When the Gaslight and Coke Company were before the House of Lords in 1843, it was discussed, and their lordships passed a resolution to throw the new shares open to the public in open auction. The promoters of the bill took time to consider the matter, and then asked the committee to alter the resolution. They refused to do so, and consequently the bill was withdrawn.

Mr. CALVERT: Show me in the Act of Parliament anything as to selling shares in the future.

Witness: Well, there is nothing in the Act of Parliament.

Mr. CALVERT: Nor in any parliamentary document of any kind?

Witness: I think not.

Mr. CALVERT: Nor in any other document of any kind?

Witness: Not that I am aware of.

Serjeant ATKINSON said he had the honour to appear before the committee on behalf of the Liverpool Guardian Society for the Protection of Trade, the Liverpool Licensed Victuallers Association, the Liverpool Tradesmen's Guild, and for other inhabitants and tradesmen of the borough who were large consumers of gas. In stating the case on their behalf, he gave a chronological history of the several applications made by the gas companies for additional powers, and submitted that the whole course of legislation proved that Parliament had clung to the principle of requiring that whenever new capital was required to be raised, the shares, or a part of them, should be offered to the public. It was on the acceptance of these terms that the present company had secured the monopoly of supply in the district, a monopoly which the inhabitants of Liverpool had never sought to disturb, regarding it as a solemn compact made between all parties—a compact which had received the sanction of Parliament—and therefore was the highest compact known to the law. The subject was one of the utmost importance to the inhabitants, especially to the working classes of the town, and he felt convinced that if the company obtained their bill in its present form, a renewal of the agitation which existed in former years would take place, and a new company be before Parliament next year. The company asked the committee to disturb existing regulations, and so at once put £85,000 into their own pockets, and saddle the consumers of Liverpool with a permanent extra charge on account of dividends of £6000 a year. He hoped the committee would not do so, but would compel the company to abide by the compact which they made in 1848, and upon the faith of which they were left in possession of the entire gas supply of the town.

The CHAIRMAN: Your case is that this is a matter of compact.

Serjeant ATKINSON: Yes.

Mr. CALVERT replied upon the whole case, contending that the opponents had failed to show any such compact as they alleged to exist, and that the company were only asking what was reasonable, and within the limits usually sanctioned by Parliament.

The room was then cleared. After the lapse of a quarter of an hour, counsel and parties were called in again.

The CHAIRMAN said: The committee have approved the preamble of the bill, including the mode of raising the proposed capital at 7 per cent.

The clauses were then proceeded with.

On clause 13, relating to the quality and illuminating power of the gas, being read,

Mr. MILWARD said this clause and the succeeding ones were not in the bill when it was in the House of Lords, and he did not know the circumstances under which they were now inserted.

Mr. CHALLONER SMITH (parliamentary agent) said they had been inserted on the suggestion of Lord Redesdale.

Mr. MILWARD said as the promoters did not put them in of their own accord, they would probably not object to have them struck out. He must certainly object to them himself. The 13th clause enacted that "The 42nd section of the recited Act, relating to the quality of the gas, shall be deemed and taken to apply to the gas supplied by the company to private consumers as well as to the public lamps, and all gas supplied by the company shall as regards purity, be as far as reasonably practicable free from sulphuretted hydrogen and other compounds deteriorating its purity. He should like to know what "as far as reasonably practicable" meant, and who was to determine what was the range of reasonable practicability. On behalf of the corporation of Liverpool, he should contend that the legislation of 1848 ought to be perpetuated, or else that the enactment now substituted should be more specific. The 14th clause provided for the erection of a test-meter, but there was no provision for its maintenance. There were also other matters in connexion with this clause which would arise hereafter. The 15th clause enacted that before the corporation could proceed to test the gas they must give six hours notice to the company. This was about as unworkable a condition as could be suggested. He did not mean to impute any unfairness on the part of the company, still, the gas in that interval might be changed. And there was no reason for such a provision. If the company were doing right, the sooner their gas was tested the better for them. Besides, there must always be some efficient person on the works in whose presence such experiment could be conducted without notice at all. The provision in this clause for the production of the order of the corporation, and for the companies servants giving examiner "all reasonable facilities," the restriction of the test to the apparatus provided by the company, the absence of any definition as to the illuminating power, and the discretion given to the justices to inflict, on failure of compliance, a fine which might be only nominal, were all objectionable.

The CHAIRMAN remarked that there was no illuminating power prescribed in the bill.

Mr. CALVERT said it was by reference to the Act of 1848.

Mr. MILWARD urged that instead of adopting the clauses he had quoted, it would be better that the several matters should be left entirely upon the basis of the old legislation. He believed the company did, as they were required to do by the Act of 1848, supply gas "of the best and purest quality," and they had every facility for doing it. Hitherto there had been no complaint on the subject, and he did not at all suggest that they were now seeking to escape the obligations imposed upon them. With reference to these clauses, the 16th, which threw the expenses attending the experiments upon the corporation in the event of their failing to establish a case against the company, he would much prefer that the existing legislation should remain. If, however, there was to be any alteration, he hoped that it would be made understandable, and that, especially in reference to the illuminating power, there might be some more definite test upon which, if necessary, they could go to the magistrates. That had been done in several instances, and the actual limits of the impurities had been fixed. When that was done, the only question before the magistrates was, "Have these limits been exceeded?" The only alteration which the corporation desired was, that the provision in the 48th clause of the Act of 1848, which gave the standard of illuminating power as "18 wax candles" should be changed to "20 sperm candles"—an alteration in conformity with parliamentary practice and the recommendations of gas engineers.

The CHAIRMAN suggested that counsel on each side should consult and see whether some agreement could not be come to. The promoters had not inserted the clauses, and the opponents of the bill did not want them.

After some consultation between the parties,

Mr. MILWARD said he proposed to take the clauses from the Metropolis Gas Act, with which he should be perfectly satisfied.

Mr. ASPINALL said, if his learned friend would agree to give the company the metropolis maximum price, he would accept the other provisions of the Act.

A further consultation was held, but the parties not agreeing, the proceedings were adjourned until the next day.

TUESDAY, MAY 23.

Mr. C. SMITH said he proposed to strike out the 13th clause of the bill which was read by Mr. Milward on the previous day, and to substitute for it the following:—

13. The forty-second section of the recited Act is hereby repealed, and from and after the passing of this Act all gas supplied by the company shall be of **the best and** purest quality; and shall be, with respect to its illuminating power, at a distance

as near as may be of one thousand yards from the works, such as to produce, from a bat's-wing or fish-tail burner consuming five cubic feet of gas per hour, a light equal in intensity to the light produced by not less than twenty sperm candles, of six to the pound each, burning one hundred and twenty grains an hour.

The clause was, after some conversation, agreed to.

Clauses 14, 15, and 16, which as they stood in the bill were objected to, were settled as follows:—

14. The company shall within twelve months after the passing of this Act cause to be erected and shall at all times thereafter maintain an experimental meter, or experimental meters, and each meter shall be respectively furnished with a bat's-wing or fish-tail burner capable of consuming five cubic feet of gas per hour, with other necessary apparatus for testing the illuminating power and purity of the gas, and the same shall be erected in such places as shall be agreed upon between the company and the corporation of Liverpool, or in case of difference as shall be settled by the recorder of the borough of Liverpool in quarter sessions, and the same when erected shall be under the joint custody of the corporation and the company.

15. It shall be lawful for the corporation, by order in writing, to appoint some competent and disinterested person, and the person so appointed, on giving three hours previous notice in writing to the company, may, at any reasonable hour in the daytime, on production of the said order, and in the presence of the manager or other officer of the company, if he attend at the time appointed, make experiment of the illuminating power and purity of the gas by means of the experimental meter and other apparatus before mentioned; and the company and their officers shall afford all reasonable facilities and assistance for the making of such experiment; and if it shall be proved to the satisfaction of any two justices, not being directors or shareholders of the company or members of the corporation, after hearing the parties, that the illuminating power and purity of the gas supplied by the company did not, when so tested as aforesaid, equal the illuminating power and purity by this Act prescribed, or that the company or their officers refused to afford such reasonable facilities as aforesaid, or hindered or prevented the making of such experiment, in any such case the company shall forfeit such sum not exceeding twenty pounds as the justices shall determine.

16. The costs of and attending such experiment, including the reasonable remuneration to be paid to the person making the same, and the costs of the proceedings before the justices, shall be ascertained and determined by such justices, and in the event of any penalty being imposed on the company, such costs, together with the penalty awarded, shall be paid by the company; but in the event of the gas being found, when tested, not to be of less illuminating power or purity than by this Act prescribed, such costs as the justices may determine shall be paid by the corporation to the company, and shall be paid or levied accordingly.

The bill as altered was then passed.

Legal Intelligence.

COURT OF QUEEN'S BENCH.

(Sittings in Banco, before Lord Chief Justice COCKBURN, *and Justices* BLACKBURN *and* MELLOR.)

TUESDAY, MAY 9.

IN RE THE SHEFFIELD GASLIGHT COMPANY (APPELLANTS), THE OVERSEERS OF THE POOR OF THE TOWNSHIP OF SHEFFIELD (RESPONDENTS).

Mr. OVEREND, Q.C., and Mr. BAXTER appeared for the appellants, and Mr. MELLISH, Q.C., Mr. MAULE, and Mr. WEST for the respondents.

In this case a rule had been obtained for a *mandamus* directed to the justices of the West Riding of York to show cause why they refused to enter, or cause to be entered, continuances from session to session to the next general quarter sessions of the peace to be held for the West Riding, upon an appeal of the Sheffield United Gaslight Company against a rate or assessment made by the overseers of the poor of the township of Sheffield, in the said Riding, on the 11th of November, 1859, and at such next general quarter sessions to proceed to consider, award, and order such costs as by the said justices, in their discretion, shall be thought meet, reasonable, and just, to be paid by the said appellants to the respondents in pursuance of the several Statutes in that case made and provided.

It appeared that on the 11th of November, 1859, the overseers of the poor of the township of Sheffield, in the West Riding of York, made an assessment upon the Sheffield United Gaslight Company to the poor-rate of the township. The company appealed against the assessment, and the appeal came on for hearing at the Easter General Quarter Sessions, at Pontefract, in 1860, when the court made an order to this effect: "That the appeal be respited until the next General Quarter Sessions of the Peace, to be holden by adjournment at Rotherham, in and for the said Riding, and to enable the counsel on the appeal to agree upon a case for the opinion of the Court of Queen's Bench, with a view of ascertaining the principle upon which the company ought to be rated." And it was further ordered: "That, if the principle can be so ascertained by reference to the Court of Queen's Bench, the appeal should be referred to an arbitrator at the bar, who is to certify whether the appellants have been assessed at too high a sum, and to what extent." And, further, that if the counsel disagreed as to the case, then an umpire was to be nominated by the deputy-clerk of the peace. After the case had been submitted to and adjudicated upon by the court, and the principle upon which the company ought to have been rated was ascertained, and the appeal had been referred to an arbitrator at the bar, an award was made on the 20th of April, 1864, whereby the arbitrator certified that the Sheffield Gaslight Company had not been assessed in the rate at too high a sum. From time to time the appeal was respited from quarter session to quarter session, in order to keep the same alive. At the General Quarter Sessions for the West Riding, held by adjournment at Rotherham, in July last, which were the first sessions after the arbitrator published his award, the award was brought into court, and the appellants counsel objected that the court had no power to give costs, but the court, after hearing counsel on both sides, confirmed the rate with costs, the chairman observing: "We confirm the rate, and give the respondents all the costs which it is in the power of the court to give." The respondents accordingly made out a bill of costs, and delivered it to the appellants; but it contained no item touching the case which had been before the court, but charged them with the costs of the reference and the trial of the appeal. The deputy-clerk of the peace for taxation refused to give the respondents any costs of the reference of the award, on the grounds that the sessions had no power to give any costs except the costs actually incurred at the sessions, and he absolutely refused to go into the taxation of any of the costs incurred in respect to the reference and award. At a subsequent quarter sessions, held at Doncaster, on the 21st of October last, the respondents moved the court to direct the deputy-clerk of the peace to tax the costs in respect to the said reference and award, when the chairman asked the deputy-clerk of the peace what had been the practice with respect to the costs, whereupon the clerk of the peace informed him that the practice had always been to allow costs, but he had been advised that the practice was illegal, and for that reason he had in this case refused it to them. The court of quarter sessions held that they had no power to interfere, and declined to do so.

Mr. OVEREND contended that immediately the quarter sessions made the award sending it to the arbitrator they were *functi officio*, and all the powers they had after that was to enter the award *nunc pro tunc*, as if they were the original sessions before whom the appeal came. The subsequent court of quarter sessions were a different tribunal, and know nothing of the merits, and were not a proper tribunal to pass or grant the costs. The first order of quarter sessions was silent as to costs, and the arbitrator to whom the matter was referred had no authority to grant costs. The subsequent sessions had only to enter the judgment of the arbitrator, and being a different tribunal they had no authority or power to grant costs, and the clerk of the peace, when the case came on for taxation, declined to allow the costs of the arbitration. There had been a taxation, and various sums had been awarded, but the deputy-clerk of the peace had exercised his judgment and discretion and disallowed others. He had acted according to his interpretation of the Statute, and that was not refusing to exercise a jurisdiction. The deputy-clerk of the peace had acted according to the best of his judgment, and the fact of his coming to a wrong conclusion was not sufficient for this court to interfere.

Mr. MELLISH, Q.C., said the court confirmed the rate, and gave all the costs which it was in their power to give. Then when they came to tax the costs, the clerk said he had no power to give those for arbitration, and he declined to give them. Surely that was not exercising a discretion.

Mr. OVEREND said it could not be said that it was a declining of jurisdiction by the deputy-clerk of the peace if he came to an erroneous conclusion.

Mr. Justice BLACKBURN said that if the deputy-clerk of the peace had granted what he had no duty to do, *pro tanto* it was a nullity; and if he declined to grant what he ought to have done, then it was *pro tanto* a declining of jurisdiction.

Mr. OVEREND said the whole bill was taxed. Certain sums were allowed, and certain others struck out.

Mr. MELLISH, Q.C., said that for his learned friend's arguments to be of any effect, all jurisdiction as to costs ought to have been made and exercised at the time the order of reference was made, and not after the reference.

The LORD CHIEF JUSTICE said that all the court had to do after the arbitration was simply to enter the result of the arbitration as their judgment.

Mr. MELLISH said the appeal was a respite from session to session, in order that the award might come back and be entered for their judgment. They could not know what would be the result, or what principle to go on, until after it was worked out. The whole matter was left open for the arbitrator to state the amount, and if his learned friend was right he ought to have objected to the respondents having been paid costs of any kind.

After some further arguments,

The LORD CHIEF JUSTICE in delivering judgment said: I am of opinion that this rule should be discharged. It appears to me that the 13th section of the 12th and 13th Vict. cap. 45, which authorizes the Court of Quarter Sessions to refer the matter before them on appeal to an arbitrator, when it comes to be looked at in all its provisions, amounts to this, that the court whose province and duty it may be to determine the appeal, may substitute (where the convenience of the case requires it, and with the consent of the parties) an arbitrator or an umpire, or in some cases two arbitrators and an umpire, to perform the service, and that at the time they do that they may, as the Act provides, impose such terms and provisions as they think proper; amongst other things, they may determine as to what shall be be done with reference to costs. I do not at all agree with the view put forward by Mr. Mellish and Mr. Maule, that the court may respite the case from one sessions to another, and then the arbitrator or the umpire having made his award or umpirage, as the case may be, they may take upon themselves to consider what has been so decided by the arbitrator or umpire, and allow such cost, as may appear to them to be right. It appears to me the language of the section would have been altogether different from what it is if that had been the intention of the Legislature. No provision of that sort appears to me to be applicable to such a supposed case. The award or umpirage being made at the Court of Quarter Sessions next or next but one after the publication of such award or umpirage, application may be made, not to have the order confirmed, but to have the award or umpirage entered as the judgment (as it appears to me from the language of the section) of the court in which the appeal originally came on for trial, and by which court the order of reference was made. It strikes me it would be productive of great inconvenience—almost a conflict of jurisdiction—(terms having been imposed as the conditions of the reference by the court which originally made the order) if the award or umpirage which is made under those terms and conditions were to be reviewed and confirmed, or disallowed by subsequent courts; and it appears to me, taking the whole language of the enactment altogether, it cannot be so construed. I think, therefore, we must look to see whether any order was made as to costs at the time the order of reference was made. If there had been any, I think it would have been binding; but none having been made, we must take it that each party must pay his own costs, there being no power in any subsequent court, it appears to me, of doing anything more than simply to enter the award or umpirage, as the case may be, as the judgment of the court before whom the appeal originally came. Therefore, I think, it follows according to the true construction of this section, the Court of Quarter Sessions, in the first instance, not having made the order as to the costs, no subsequent court has any power or authority to dispose of the question of costs, and consequently the applicants cannot have their costs.

Mr. Justice BLACKBURN: I am of the same opinion. The 13th section of the 12th and 13th Vic., cap. 45, upon which the question turns, gives power to the Court of Quarter Sessions to order, with the consent of the parties, that the matter of appeal shall be referred in such manner and upon such terms as the court shall think reasonable and proper; and then it proceeds to say, after the award has been made and finally published, the Court of Quarter Sessions may be moved to enter it as the judgment of the Court of Quarter Sessions in the appeal, and it shall be as binding and effectual as if given by the court. I think upon that the true and fair construction of the Statute is, that where the court refers by consent of the parties, and not otherwise—when the terms have been agreed upon which it should be referred and embodied in the order by consent of the parties—the court orders that it shall be referred upon such terms, and then those terms are finally settled once for all; that the terms upon which it is to be referred determine and include how the costs are to be borne, and being once settled at that time they have settled it for ever, and what a subsequent Court of Quarter Sessions does is merely the ministerial duty of entering the appeal. Then in the present case the Sessions made an order which (whether they could or could not have done it is immaterial at this time) not merely did not keep back, but did not intend to keep back to themselves any future discretion on appeal, but meant to refer the whole jurisdiction; and being silent as to costs, the effect of that being silent is that each party must bear their own costs. It may be that when the parties consented to the reference, it had been present to their minds, they might have agreed that the costs should

abide the event of the decision, or be in the discretion of the arbitrator, and that being so, I think it is in effect the terms were, the thing was to be referred, and each party should bear his own costs; and, therefore, I think this rule should be discharged.

Mr. Justice MELLOR: I am of the same opinion. I think this is a new power, given no doubt by the Legislature in consequence of difficulties which were felt in cases where it was proper to refer to arbitration, and where there were difficulties felt in the enforcement of the award when it was made. This Statute was introduced in order to give, with the consent of parties, power to the quarter sessions to order a reference out of court upon such terms as they thought fit and proper, between the parties to such agreement. It was competent, therefore, for the parties to disagree or refuse their consent to any particular form of order, or to assent to any particular form of order. Therefore, if the order had been in the exercise of justice, that the costs should abide the event, or should be in the discretion of the arbitrator, or possibly that it should be referred to some future sessions—upon that I do not express any strong opinion—but, at all events, if there had been special terms on which the quarter sessions were authorized, with the consent of the parties, they have exercised, as it appears to me, to the fullest extent they intended to exercise: and their being silent as to costs, in other respects the terms being agreed upon, then Mr. Maule asks us that the subsequent quarter sessions, without any reservation of authority at all, not consisting of the same persons, but probably of different persons, should have power to say whether or not the costs should be borne by one or the other of the litigant parties. I think that they have no such jurisdiction, and therefore that this rule should be discharged.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

REPORT OF THE SPECIAL COMMITTEE OF THE COMMISSIONERS OF SEWERS ON GAS.

(*Continued from page* 405).

With regard to the defective lights at the King William statue, having read the reports of your engineer, and heard the explanation given by the person who supervises the public lighting, we consider that the defect was attributable to the gas company. It has been completely remedied.

We think the application of Mr. Greenfield, in respect of his carburetting apparatus, should not be complied with.

We are of opinion that the daily reports made during the last three years by the police to the commission have been useful, and that, if possible, their extended co-operation in respect of the public lighting should be secured.

It seems to us that the inspectors of pavements, whose avocations necessarily occupy them the whole day, cannot, unless upon exceptional occasions, be expected to discharge duties in the night also.

With regard to the public lighting in future, we are of opinion that the only mode of ensuring efficiency, and setting at rest the interminable disputes which have existed between the commission and the companies, will be for the commission to take upon itself the lighting, extinguishing, cleansing, and entire charge of the lamps; and that this plan will alone enable the commission in future successfully to apply such improvements as, from time to time, science may develop. The companies have refused to accede to this, unless a meter is affixed to each lamp. We think that if meters were to be affixed to a few lamps, and proper adjustment made with regard to the remainder, and an amicable understanding could be maintained between the companies and the commission, sufficient precautions would be taken to ensure a fair result, and that fixing a meter to each lamp would then be an unnecessary expenditure of money. It is clear that insisting upon a meter to each lamp is calculated to hinder the commission from taking upon itself the entire charge of the public lighting.

Whether the commission may call upon the gas companies to supply and maintain meters at the public lamps, is a question for further consideration.

Whether this be carried into effect or not, we think that the placing governors or regulators, so as to ensure in some degree that the proper quantity of gas is afforded to the lamps, should be required of the companies.

As to Deficiency in Supply of Gas to Private Consumers.

This has been frequently complained of. The observations made by your officers do not, however, show generally a deficiency of pressure upon the mains of the companies; it is possible that in some cases the mains may be insufficient for the large draught upon them, or the supply-pipes to the houses, or the mains of the companies, may be defective. But we have no means of ascertaining whether this be the case or not, and must remark that it is manifestly to the interest of the companies to afford a copious supply of gas to private consumers.

As to Deficiency in the Illuminating Power of the Gas supplied.

Since the passing of the Metropolis Gas Act, 1860, many complaints have been made of the deficiency in illuminating power, and as far as we can learn, considerable unanimity of opinion exists among consumers that the illuminating power is less than it formerly was; the justice of the complaints must, from their very nature, be mainly determined by the observations of your gas analyst, and, for detail, we refer to his report, as the matter is there fully treated of, and a complete series of observations of illuminating power, are given from 1853 to the present time.

From that report, and the tables attached thereto, it appears to us, that during the period of competition between the companies, gas of an illuminating power above that prescribed by the Great Central Act was given; but that, since the passing of the Metropolis Gas Act, 1860, and the cessation of competition, the Chartered Company has raised the power 1 per cent. only above the former average, and the Great Central Company has actually diminished the power nearly 4 per cent.

We believe that the standard of illuminating power is higher in some of the provincial towns of England than it is in the metropolis, and that, recently, Parliament has not sanctioned the supply of gas with a less illuminating power than 14 candles to any town, whereas, that supplied to the City is but 12 candles.

The Metropolis Gas Act, 1860, indicates a course by which the companies may be dealt with, before the magistrates, in respect of illuminating power, and, sufficient time having elapsed, since the passing of the Act, to have enabled them to give at all times gas of the standard illuminating power, we are of opinion that, upon all future occasions when the gas falls below that standard, they should be proceeded against.

As to Impurities in the Gas supplied.

The Metropolis Gas Act, 1860, also imposed certain conditions in respect of purity, and, according to the report of your gas analyst, the prescribed purity has scarcely ever yet been attained, excepting recently in the case of gas supplied by the City of London Company.

It is also an important fact, and one which may serve to show how much the City has lost by the destruction of competition between the companies, that whereas before the year 1861 the gas supplied to the City scarcely ever contained 20 grains of sulphur in 100 cubic feet, from that date down to last December it has rarely happened that the quantity has not been exceeded (the gas of the City of London Company excepted). In this respect, therefore, two of the companies have clearly not carried out the stipulations of the Metropolis Gas Act, 1860.

The question of the purity of the gas was under the consideration of a committee of your honourable court in 1863, and on the 30th of November in that year a conference on the subject was held with the chairmen of the three companies. It is due to those gentlemen to state that they then expressed an earnest desire to produce a gas equal in purity to the standard prescribed by the Act, and agreed to consult Mr. T. G. Barlow (a gas engineer of considerable eminence) on the best mode of doing so.

One of the companies subsequently forwarded to that committee a list of the references proposed to be made to Mr. Barlow. Upon consideration of them, your gas analyst thought that they were not so framed as to elicit an opinion on the points on which information was desired. He accordingly amended them, and his amendments were forwarded to the company; but we have reason to believe that the references were, nevertheless, made to Mr. Barlow substantially in their original form.

The report of Mr. Barlow was laid before you on the 5th of July, 1864. He indicated a mode by which the sulphur (which, with its compounds, form the most objectionable impurities in gas) could be considerably reduced. Your gas analyst has repeatedly stated his conviction of its easy accomplishment; but before taking proceedings at law to enforce compliance with the Act of Parliament, we thought it desirable to have also the opinion of Mr. Hawksley (probably the first gas engineer in England) upon this highly important point.

On the 11th October last we received your sanction to obtain Mr. Hawksley's opinion. We immediately communicated with him, and he undertook to report upon the subject, but we have not yet received his report. We understand the delay has been occasioned partly by his great occupation in other matters, and also from the circumstance that during the recent dark and cold weather he has found it impossible to isolate retorts and gas apparatus to enable him to make the experiments which he desires. The absence of this report has procrastinated our deliberations materially. If the opinion of Mr. Hawksley corroborates that of Mr. Barlow and that of Dr. Letheby, it will supply strong additional evidence in support of any measures the commission may take against the offending gas companies.

The correctness of Dr. Letheby's recent reports, in respect of purity, have been, on one or two occasions, denied in strong terms by one of the companies, and we therefore see but little hope of settling the point, excepting by appeal to the proper legal tribunal.

It has been brought to our knowledge that a much greater chemical purity is maintained in the gas supplied to many towns in the kingdom than is required by the Metropolis Gas Act, 1860. At Birmingham, for example, the gas supplied by the Birmingham and Staffordshire Gas Company never contains a trace of ammonia or sulphuretted hydrogen; and the proportion of sulphur in the gas is rarely 17 grains per 100 cubic feet. At Ely, the gas was found to contain less than 7 grains of sulphur; Chatham, 18·2; Oxford, less than 7·5; Newcastle-on-Tyne, 4·9; Nottingham, from 10 to 17; Derby, 17·8; Hanley in Staffordshire, 14·4; Winchester, 10·9; Dublin, 17·9; Hastings, 15·9; and Exeter, 3·6; at all of these towns, therefore, the amount of sulphur is under the standard (20 grains) of the Metropolis Gas Act, 1860; and your gas analyst reports to us that in one instance only, of all the gas supplied to various parts of the kingdom, which he has examined, has he found 20 grains of sulphur in 100 cubic feet of gas.

Upon consideration of the foregoing facts and evidence, we are convinced that the standard of purity prescribed by the Metropolis Gas Act, 1860, can easily be attained. We think that ample time has been given to the companies to perfect their works, and enable them to supply such gas, and that the only reason why they have not yet done so is, that they have not used the proper means for its manufacture; we therefore consider that, in all cases, where the standard of purity prescribed by the Act is not maintained, the companies should be proceeded against as the law directs, and that no expense should be spared by the commission to enforce the specific performance of this most important obligation of the companies to the gas consumers.

As to the Price of Gas.

In considering this subject it is impossible to exclude from our minds the circumstances attending the formation of the Great Central Gas Company, and not to feel, upon full consideration of all the preceding portions of this report, that undue advantage has been taken by that company of the general powers in the Metropolis Gas Act, 1860.

With regard to the price charged for the public lamps, we are informed that a higher price was charged in the City in 1863 than in other parts of the metropolis; and we have reason to believe that such is still the case.

We must here request your attention to clause 2 of the Metropolis Gas Act, 1860, and clauses 32 to 34 inclusive of the Gas Clauses Act, 1847, by which it appears that the companies are authorized to pay not only dividends of 10 per cent. per annum upon the paid-up capitals, but also to raise to that rate any back dividends of the six years previous to the passing of the Act; and until this has been done the citizens cannot legally claim a reduction in price.

From the returns of the gas companies, given in parliamentary paper No. 457, 1864, under the head of expenditure, it will be found that deductions from profits have been made in respect of losses which accrued before the passing of the Metropolis Gas Act, 1860. It seems to us desirable to institute inquiry whether such deductions can be legally made.

After making some preliminary inquiries we requested, agreeably to your reference of the 25th of October, 1864, a conference with the directors of the three gas companies supplying the City. This conference took place on the 28th of November last, when the chairman of each of the companies, with some of the directors and their officers, were good enough to attend us.

With regard to the price charged of 4s. 6d., we drew attention, among other matters, to the fact that the South Metropolitan Company, which lights a suburban district, has lessened its price to 3s. 8d. per 1000 cubic feet; and the Equitable Company, whose district is to the west and north-west of the City, was about to lower the price to 4s. at Midsummer next.

We also drew attention to the fact that, in districts which are compact and dense, where the distributing system is short, and the draught upon the mains great, it is possible to supply gas cheaper than in suburban districts, where the pipes are laid over great lengths of road, and the consumers few and far between—the former conditions being realized in the City in the highest degree; that they had formed the basis upon which the Great Central Company had certainly framed its calculations, made its promises, obtained its standing, and procured its Act; and ventured to express an opinion of the injustice done to the consumers in a district where the conditions are altogether so favourable.

In respect of the public lights, we also drew attention to the fact that, in many parts of the metropolis, where the lamps were lighted and maintained under nearly identical conditions to those in the City of London, they were charged at a lower rate than that now paid by this commission; and that at no period since the year 1823, when gas was charged at 15s. per 1000 cubic feet, had so high a price been paid as now. And we expressed our opinion that so large a customer as this commission, and one from whom the receipts could be so regularly calculated upon, was entitled to receive every consideration at their hands.

In reply to our observations, the directors of the City of London Gas Company stated that the reduction in the price of gas to 4s., between 1848 and 1861, had seriously affected their revenue; that in 1851 their dividends had fallen to 4 per cent., in 1854 to 3, and in 1856 to 2½ per cent. per annum; that since then they had gradually risen, but that it was only in 1863 their dividends had increased to 9 per cent., whereas the Act entitled the proprietary to a dividend of 10 per cent.; that they had not yet paid the arrears upon the back dividends; that the company had no reserve-fund, and that they could not reduce the price of gas at the present time.

The directors of the Great Central Gas Company stated that they had not yet realized dividends equal to those they were authorized to divide by the Metropolis Gas Act, 1860; that the compensation which they had to pay for a fire, accidentally caused by their works to premises in Wood Street, had absorbed a considerable portion of their profits; that that accident was an illustration of the great responsibility attaching to gas companies, and the necessity of having a reserve-fund to meet such contingencies; and looking at all these circumstances, they must decline making any reduction in the price at present, although they hoped that such reduction might take place ere long, and possibly about the year 1866, but that they could not give more precise intimation as to the time when such reduction might be expected, nor pledge themselves in any way.

The directors of the Chartered Gas Company enlarged on the heavy responsibilities of gas companies; they stated that their company had lately been put to very heavy expense to enable them to comply with the requirements of the Act of Parliament, in respect of illuminating power and chemical purity, and that they contemplated the erection of large additional works; that they had not been able to pay for some years past the dividend of 10 per cent. authorized by the Act; and for these reasons, could not promise any immediate reduction, but they hoped to be able to do so before long.

With regard to the cost of public lighting, the directors generally stated that until recent years the charges had been framed upon an erroneous principle, that the former price was unremunerative to them, and that recently the companies had come to the conclusion there was no reason the price to the commission should be less than to other consumers, and that the prices had been accordingly calculated upon the amount of gas consumed, and the other expenses incurred in the lighting; and this mode they thought to be fair, and one from which they could not depart.

We expressed our opinion that although the Metropolis Gas Act, 1860, had been held to apply to the City, yet that we considered it was never so intended, and our conviction that the citizens would never rest satisfied with the present gas supply, either in respect of its price, purity, or illuminating power; and our belief that upon application to Parliament the citizens would be placed in as good a position in respect of gas supply as it formerly was. The conference then came to an end.

From the general tenor of the statements, made on behalf of the whole of the gas companies, we are of opinion that there was no intention on their part to reduce the price of gas at the present time, and but slight intention of doing so until they had realized, fully, the benefits which they had anticipated would accrue to them under their contruction of the Metropolis Gas Act 1860. The provisions of that enactment were constantly referred to by them, as not only justifying them in the course they were pursuing, but, as tendering it their duty, in the interest of their proprietary, to pay dividends to the amount which the law authorized.

We suggest that it is possible, that the clauses authorizing a 10 per cent. dividend on the paid-up capitals of the companies may press with undue weight upon the City, inasmuch as two of the companies supplying gas are the oldest in London, and the capitals nominally invested in them may now be very great, and this circumstance may retard considerably that period when reduction in price might otherwise be expected. We think the subject of the actual capitals upon which dividends can legally be paid, by the gas companies, is one requiring the earliest investigation.

We now proceed to a consideration of those references which relate to the remedies for the present grievances, in respect of gas supply in the City.

As to the Commission Applying to Parliament for Power to Manufacture or Sell Gas.

In order to carry out this suggestion successfully, it would be necessary to raise and invest a capital of from £150,000 to £200,000, and to accomplish this, increased powers of taxation must be applied for; competition with three powerful companies, whose works are complete in every particular, and whose pipes are laid throughout the whole of the City, would be the consequence, and it is just possible that such competition might bring the price of gas so low as to place the commission in the dilemma, either of having no purchasers or being obliged to manufacture and sell gas at an absolute loss.

As to Buying the Mains of the Gas Companies in the City, and Contracting for the Supply of Gas.

It has been shown that there are two companies (the Chartered and the City) which divide the City between them, each having pipes within its own district only; one company alone (the Great Central) has pipes throughout the entire area of the City. It would, therefore, be most convenient to acquire the pipes of the Great Central Company.

Looking at the profits now assured to the Great Central Gas Company by the Metropolis Gas Act, 1860, it is not reasonable to suppose that it would be desirous of parting with its pipes within your jurisdiction, without making also sale of its works and pipes out of the City. Nor is it probable that compulsory powers to enforce their sale, excepting on strong public grounds, would be granted by Parliament.

Upon consideration of the usual character of legislative enactments in respect of compulsory sales of property, it seems probable that compulsory powers, if conceded at all, would be upon such terms and conditions that it would be cheaper to build entirely new works, and lay down a new distributary system.

As to Laying Down a Complete Distributary System only, and Contracting with Gas Companies outside the City to Supply the Gas in Bulk.

This may be regarded as a compromise of the larger proposition. It was suggested many years ago, when there were but two companies supplying the City, at which time there was undoubtedly more chance of its success than at the present day. It is true that it might now be done, but it would require a capital of from £50,000 to £65,000, and there might be great difficulties in obtaining the supply of gas required upon suitable terms; and other difficulties would have to be encountered. The same objections could also be urged against this mode which have been alluded to in regard of the proposal that the commission should undertake a complete system of gas manufacture and supply.

With regard to the whole of the three foregoing propositions, a broad question of general policy would have to be considered, but we have sufficiently alluded to the references to set before you some of the difficulties in the way of the adoption of either. Looking at all the circumstances attending the passing of the Metropolis Gas Act, 1860, and at the short period which has elapsed since it became law, and also at certain provisions in the Act not yet exercised, there seems to us but little probability of bringing either of the projects, if undertaken, to a successful termination at the present time.

We wish it, however, to be clearly understood that this opinion is formed with reference to existing circumstances only, and we do not say that occasion may not arise at a future day when these subjects may again be raised with advantage.

The question as to whether such projects generally should be undertaken by the corportion of London, or by the commission acting on its behalf, is an important one, but need not be further alluded to here.

We now approach the question of applying to Parliament for an alteration in the Metropolis Gas Act, 1860, so far as it affects the City of London.

It will be gathered from previous portions of this report that, in our opinion, whilst the companies have, since 1861, had a higher price for gas, and derived a largely increased revenue thereby, as well as from other causes which that Act brought into operation, that neither in the illuminating power or chemical purity have the citizens had an equivalent for it; that upon the whole, the citizens would have been better off at the present time had the conditions of gas supply, as existing up to 1859, been unaltered.

We believe, moreover, that in many towns where the standards of illuminating power and chemical purity are higher, the price of the gas is lower than it is in the City of London; and yet that the City of London has all those conditions which should make it profitable to supply gas to it at a cheaper rate than in any part of the metropolis, or, perhaps, any other part of England.

The City of London is, therefore, supplied with gas less brilliant, less pure, and at a higher price than many other places in the United Kingdom, and we consider that the City, as well as the metropolis generally, instead of being placed in an inferior position in these respects, should be the standard for the example of other towns; and we believe if these facts were set before the Legislature, that an amendment in the Metropolis Gas Act, 1860, so far as it affects the City, would no doubt be obtained.

Our recommendations are—

1. That an offer should again be made to the companies for the commission to undertake the lighting, extinguishing, cleansing, and the entire charge of the public lamps, affixing meters to every 20 lamps or thereabouts, and adopting such other precautions as will ensure a fair average consumption.
2. That the companies be requested to affix, at their expense, governors or regulators to the whole of the public lamps.
3. That the further assistance of the police be, if possible, obtained in the supervision of the public lighting.
4. That the application of Mr. Greenfield in respect of his carburetting apparatus be not complied with.
5. That all legal measures to secure to the citizens gas equal to the Act of Parliament standard of illuminating power and chemical purity should be resorted to.
6. That an application be made to the Secretary of State for the Home Department to institute inquiry as to the capitals of the several companies, and for the purpose of securing to the consumers all the advantages contemplated by the Metropolis Gas Act, 1860.
7. That after mature consideration of the subjects referred to us, we are of opinion that it is inexpedient at the present time to take measures with the view to the commission manufacturing and selling gas; but that application be made to Parliament for a modification of the Metropolis Gas Act, 1860, so far as it affects the City of London, and especially with the view of obtaining for the citizens gas of a higher illuminating power, of greater chemical purity, and at a cheaper price than that now supplied, and such other powers as may be beneficial to the ratepayers and gas consumers in the City.

If these our suggestions be carried out, we believe the citizens of London will be supplied with gas at less cost, of a higher illuminating power, and of greater purity than heretofore, and yet that the companies will continue to receive a 10 per cent. dividend on their capitals; but should the commission fail thus in its endeavours to benefit and to protect the public, we unhesitatingly advise that a respectful recommendation be made by your honourable court to the Lord Mayor, aldermen, and Common Councilmen of the City, in Common Council assembled, to consider the propriety of its providing the means for constructing works, laying down distributing-pipes, and undertaking the manufacture of gas for the citizens.

We are the less reluctant in recommending this course, because the commission possesses no funds from which to meet the cost, and would have to obtain additional powers of taxation for the purpose.

It will be seen from the foregoing portions of the report that numerous subjects have been referred to us since the date of our appointment. The references embrace almost every point relating to the gas supply of the City in which the citizens are interested, and their consideration has involved much anxious inquiry on our parts, as well as laborious research by your officers.

On the 14th day of February inst., when our labours were nearly at an end, and the preparation of the materials for this, our report, in hand, letters were received from the companies, stating that they intended reducing the price of gas to 4s. at Christmas next, although on the 28th of November last, the directors of the companies had declined to hold out to us hopes for any immediate reduction in the price. We have therefore to congratulate your honourable court on this, the first step towards the attainment of the objects so much sought for by our fellow-citizens.

All of which we submit to the judgment of your honourable court.

H. De Jersey.
F. Farrar.
Wm. H. Teulon.
R. J. Chaplin.
George Bone.
S. Green.
J. H. Elliott.

DISCOVERY OF CANNEL COAL IN NEW SOUTH WALES.—Advices have been received, by the last overland mail, of the discovery, about 80 miles from Sydney, near a line of railway now in course of construction, of a workable seam of cannel coal, which surpasses the hitherto unrivalled Boghead in richness. Its yield per ton is reported to be 17,500 cubic feet of gas of 31-candle illuminating power, and ·745 specific gravity. The discovery must exercise great influence on gas lighting in Australia, the East Indies, China, California, and South America, by enabling the gas-works of those countries to use their inferior local coals, and bring up the quality of their gas to a satisfactory illuminating power by the addition of a small quantity of Australian cannel.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE WATER SUPPLIED IN ST. MARYLEBONE, IN APRIL, 1865:—

	Total Solid Matter in degrees or grains per Imperial gallon.		Organic Matter in degrees or grains per Imperial gallon.	
Distilled Water . . .	April, 1864. 0°	April, 1865. 0°	April, 1864. 0°	April, 1865. 0°
				Ammo.
West Middlesex Water	19·28	19·84	1·24	2·00	
Grand Junction Water	20·40	20·96	1·44	1·84	
Gt. Titchfield St. Well	....	78·96	....	6·80	1·54
Cavendish Square Well	....	86·64	....	7·20	1·32

The water supplied to the parish by the West Middlesex and Grand Junction Water Companies has improved since last month—an almost necessary consequence of the dry weather and season of the year—but it is not so free from organic matter as at the same period of last year. The water from the pumps in Great Titchfield Street and Cavendish Square is far from satisfactory, the quantity of organic matter is large, and the presence of ammonia indicates that it is the product of sewage. From neither of these pumps should the water be used for drinking purposes.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE GAS SUPPLIED IN ST. MARYLEBONE, IN APRIL, 1865:—

	Illuminating Power in Sperm Candles.			Mean Pressure in 10ths of an inch.	
	Mean of 22 Observations.	Highest.	Lowest.	Highest.	Lowest.
Imperial Company's gas	14·81	15·84	13·68	17·6	7·25
Chartered Co.'s common gas . .	13·26	15·37	12·37	31·3	11·8
Chartered Co.'s cannel gas . . .	21·82	23·08	19·01	32·8	11·8

The illuminating power of all the gases has been very good during the month; the average light of the Imperial Company's gas being little short of 15 candles. The common gas of the Chartered Company has exceeded 13 candles, and their cannel gas has reached nearly 22 candles. As regards purity, the Chartered common gas only has contained sulphur in excess of the quantity allowed by law; all have been free from sulphuretted hydrogen, but have contained more or less of ammonia.

FOLKESTONE WATER-WORKS COMPANY.—This company are taking steps to increase their capital by the creation of 400 new shares of £10, and to obtain borrowing powers to the amount of £2000 more.

THE WOOLWICH EQUITABLE GAS COMPANY.—The annual general meeting of the shareholders of this company was held on Wednesday (Mr. S. Farnfield in the chair). The report, which was of a most satisfactory character, recommends the payment of a dividend at the rate of 10 per cent. per annum, and the abstract of accounts showed that, in addition to paying

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	32	51	70	89	107	126	149	177	208 lb.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 14 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. l.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphon, 2-quart	15 0	14 0	13 6	13 0	12 0	—

COALS.—*Per Ton.*

Newcastle.—Unscreened.		*Scotch Cannel.*	
Burnhope	6s. 3d.	Boghead (at Leith)	45s. 0d.
Lanchester Pelaw	6 6	Kirkness, best	23 0
Whitwell Primrose and West Wear	6 9	Capeldrae, 1st quality	20 0
Medomsley, Eighton Moor, and Ravensworth Pelaw	7 0	Ditto, 2nd ditto	12 6
Pelaw and North Pelton	7 3	Lesmahago (at Glasgow)	24 6
New Pelton, Pearth, South Pelaw, Washington Hutton, West Leverson, and South Pearth	7 6	Ditto (at Granton)	25 6
Pelton	7 9	Arniston	27 6
Ramsay's Newcastle Cannel	16 0	Wemyss	20 0
		Haywood, Wilsontown (at Granton)	14 0
		Pirnie	14 0
		Lothian's Cannel (F. O. B. at Leith)	25 0
		Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton.		*Foreign.—Per Keel.*	
Chatham and Rochester	5 9	Barcelona	£25 0
Cork	9s. 0d. to 9 6	Bordeaux	£15 to 16 0
Dover, Folkestone, & Ramsgate	6 3	Boulogne and Calais	£7. 7s. 6d. to 7 10
Dublin	9s. 6d. to 10 0	Cadiz	17 0
Exeter Quay	8 6	Copenhagen	£8. 5s. to 8 15
Ipswich	8 6	Genoa	24 0
London (from Leith)	8 6	Hamburg	8 0
London (Pool)	6 0	Havre de Grace	9 0
Lowestoft and Yarmouth	4 6	Leghorn	23 10
Portsmouth & Southampton	7s. to 7 3	Lisbon	15 0
Plymouth	7s. 9d. to 8 0	Rotterdam	7 10
Shoreham	6 6	Stettin	10 5
Whitstable	5 9	Trieste	23 0
Weymouth	7 6	Venice	25 0

SUNDRIES.

Best Newcastle Fire-bricks—per 1000	£2. 10s. to	£2 15s. 0d.
Cliff's Fire-bricks (at Wortley)—per 1000		2 15 0
Ingham's ditto (at Wortley)—per 1000		2 15 0
Fire-clay Retorts—per foot run	5s. 6d. to	0 7 0
Tough Cake Copper—per ton		82 0 0
English Pig Lead—per ton		19 15 0
Welsh Bar Iron (in London)—per ton		7 12 6
Foreign Spelter—per ton		21 5 0
English Block Tin—per ton		97 0 0
Banca—per ton		97 0 0
Tarred Rope Yarn—per cwt.		1 6 0

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited)	20 0 0	5 0 0	17 to 17½
1000	20	Do., preference	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited)	5 0 0	5 0 0	5⅞ to 5¾
10000	5	Do., second issue	3 0 0	5 0 0	3½ to 3¾
10000	5	Do., third issue	1 0 0	5 0 0	1¼ to 1⅜
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29⅜ to 30
8200	20	Do., new (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27¼
12000	50	*Chartered*	50 0 0	10 0 0	78 to 80
6000	50	Do.	30 0 0	10 0 0	49 to 51
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30 0 0
10000	10	Do., B shares	10 0 0	4 0 0	7½ to 7¾
8000	10	Do., new shares. City of Moscow (L) Colonial & General	10 0 0 4 0 0	10 0 0	15 to 15½ 2 to 3
17490	25	*Commercial*	25 0 0	10 0 0	42½ to 43½
3334	20	Continental G. & W.	6 0 0	6 0 0	
20000	20	Continental Union	10 0 0	8 0 0	10¼ to 10⅝
5827	5	County & Gen. (L)	5 0 0		5 to 5½
2000	5	Do., preference (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17¼ to 17⅝
5000	10	Do., preference	10 0 0	6 0 0	12¼ to 12½
4000	50	*Equitable*	50 0 0	10 0 0	87 10 0
4000	25	Do., new shares	21 0 0	10 0 0	36¾ to 36¾
23406	10	European (Lim.)	10 0 0	10 0 0	13¾ to 14
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6¾ to 7
20000	10	*Great Central Gas Consumers* (Hong Kong (Lim.)	10 0 0	10 0 0	17 to 17½
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	87 to 87½
1300	100	Do., bonds	£100	10 0 0	198 0 0
7000	25	Imperial Austrian	10 0 0		10 to 10¼
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	13 14 3	90 10 0
4000	40	*Independent*	40 0 0	10 0 0	71 to 73
4904	50	*London*	50 0 0	10 0 0	80½ to 80¾
5519	25	Do., 1st pref.	25 0 0	6 0 0	29 to 30
1921	50	Do., 2nd pref.	50 0 0	6 0 0	
870	50	Do., 3rd pref.	50 0 0	6 0 0	
18781 *l*		Do., 1st pref. sk		6 0 0	
11823 *l*		Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	6 0 0	
150300	1	Oriental, Calcutta	1 0 0	8 0 0	1½ to 1⅝
10000	5	Ottoman Limited	5 0 0		3 to 4
10000	10	Para (Limited)	10 0 0	5 0 0	10½ to 11
9000	60	*Phœniz*	60 0 0	10 0 0	90 to 91
3600	100	Do., new	10 0 0	7 10 0	14 to 15
144000	8s.	Do. (capit. profits)		5 0 0	
5000	20	*Reliff* Rio de Janciro (L.)	20 0 0	10 0 0	35 to 37
4138	5	Singapore (Lim.)	5 0 0		
2000	5	Do., preference Shanghai	5 0 0	7 10 0	
4000	50	*South Metropolitan*	50 0 0	10 0 0	80 to 82
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15½ to 16
10000	10	Do., new	4 0 0	10 0 0	7 5 0
9000	50	United General (Dublin & Limerick)	50 0 0	4 12 0	36½ to 37½
10000	10	*Victoria Docks*			
1500	10	*Wandsworth & Putney*	10 0 0		
1500	10	Do., new shares			
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16¼ to 16⅝
10000	10	Do., B shares.	5 0 0	10 0 0	8¾ to 9¼
		Do., C shares.	2 0 0	10 0 0	4 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	5 17 6
551	10	West London Junction (Lim.)	10 0 0	6 0 0	
520	10	Do., preference	10 0 0	6 0 0	

the dividend recommended, there would be a handsome balance to carry forward. The report was unanimously adopted, and a dividend declared in accordance with its recommendation. Messrs. Blest, Hodgson, Allinson, and Vant were re-elected directors, and Messrs. Johnson and Hughes auditors. Gratuities were voted to the secretary and clerk, and W. Farnfield, Esq., was appointed solicitor to the company.

SETTLEMENT OF THE GAS QUESTION AT FOLKESTONE.—The directors of the Folkestone Gas Company and the promoters of the Folkestone Gas Consumers Company have come to an arrangement, in pursuance of which the latter company will not be proceeded with. The terms of the agreement, which was signed on the 19th inst., are that the old company shall reduce the price of gas to 4s. per 1000 cubic feet for two years, the directors having no power to make an agreement for a longer time; that the works shall be removed at an early date; that the old company shall pay £200 towards the expenses incurred by the new company; and that, of the new capital to be raised, £4000, in £10 shares, shall be allotted to shareholders in the new company. This settlement of the dispute which has been so long pending is looked upon as highly satisfactory by the consumers generally.

THE SALE OF SPANISH GAS-WORKS.—Five offers were made on the 6th inst., the day fixed for receiving tenders for the gas-works of Xérès, Valladolid, Burgos, Alicante, Pampeluna, and Carthagena. A private individual of Pampeluna offered £12,600 for the works in that city, on condition that the expenses of the sale should be paid by the vendors. A capitalist of Madrid offered £29,400 for the works of Alicante and Carthagena, payable in equal portions, extending over six months. An English company proposed to purchase the Alicante, Carthagena, and Xérès works for £73,600, payable in four equal portions, at intervals of two months, commencing on August 1st next. A French company offered £140,800 for the six works, of which they proposed to pay £19,000 in cash, and the balance in monthly instalments; and, lastly, an English company offered £132,000, payable in instalments at intervals of two months, commencing from August 1, 1865. The various offers are under consideration.

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

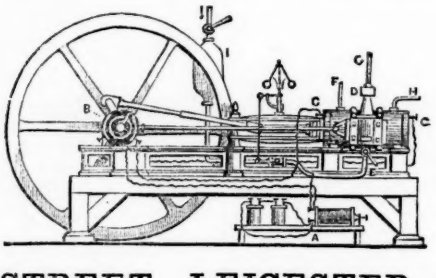
Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

"George Glover and Co., per centage of error on the number tested, 2·116.
Thomas Glover ,, ,, ,, 2·812.
Croll, Rait, and Co. ,, ,, ,, 5·540.
Thomas Fletcher ,, ,, ,, 15·121.
Joseph Boulton ,, ,, ,, 25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

LENOIR'S PATENT GAS-ENGINE.

PUBLIC EXHIBITION,



From 11 to 1, AND 3 to 5 Daily.

40, CRANBOURNE STREET, LEICESTER SQUARE, LONDON

Manager and Secretary (pro tem.) MR. C. W. WOOD.

MANUFACTURERS, READING IRON-WORKS COMPANY (late BARRETT, EXALL, and ANDREWES).

Consumption of Gas not more than 70 feet per horse-power per hour of ACTUAL *work.*

The Gas-Engine is elegant in appearance, in construction simple; there is no boiler, generator, or accumulation of power, so that there is no danger. It is very clean and free from heat, smoke, dust, dirt, or noise. Its power is either constant or intermittent, and its cost only co-existent with its working. No skilled engineer is required. It can be instantly started, and as quickly stopped. Being light in weight, it can be worked in any apartment, or on any floor, and where steam-power would be totally inadmissible. With the leading Fire Insurance Companies it does not entail any charge for extra risk. The price of the Engines, including the necessary apparatus, is as under—½ horse-power, £65; 1 horse-power, £85; 2 horse-power, £110; 3 horse-power, £135. The usual terms to the Trade, &c.

CONTENTS.

	PAGE
Notes upon Passing Events:—	
Proposed Substitution of Stone Pavements for Macadam's System	453
Middle-Class Schools	453
Rejection of the Proposed Grant to Mr. Bazalgette by the Metropolitan Board of Works	453
Death of Sir Joseph Paxton	454
The Report of the Inspector under the Alkali Factories Act	454
The Debate in the House of Lords on the Imperial Gas Bill	455
Circular to Gas Companies:—	
Rejection of the United General Gas Company's Bill	455
Sir John Gray's Photometry	456
The Future of Cannel Gas	456
The Meeting of the British Association of Gas Managers	456
Register of New Patents:—	
Applications for Letters Patent	456
Grants of Provisional Protection	457
Invention protected for Six Months	457
Notices to Proceed	457
Patents which have become Void	457
Parliamentary Intelligence:—	
Progress of Bills in House of Lords	457
Progress of Bills in House of Commons	457
House of Lords Committee—United General Gas Bill	457
Legal Intelligence:—	
Court of Queen's Bench—Stevens and Anderson *v* the Churchwardens of Aldershot	473
Miscellaneous News:—	
Meeting of the Oriental Gas Company	474
Meeting of the Imperial Continental Gas Company	476
British Association of Gas Managers	477
The Lighting of Saragossa with Gas	479
Dr. Whitmore's Report on the Quality of the Water supplied in St. Marylebone, in May, 1865	480
Dr. Whitmore's Report on the Quality of the Gas supplied in St. Marylebone, in May, 1865	480
The Exhaustion of our Coal-Mines	480
The Gas Question at Gravesend	480
Share List of Metropolitan Gas Companies	479
Price Current	479

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, June 27, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JUNE 13, 1865.

Notes upon Passing Events.

THE metropolitan parishes are beginning to feel the weight of that very necessary reform, the abolition of the turnpikes; roads wear out rapidly under the ceaseless traffic of the main thoroughfares, and the consequent taxation is not pleasant to bear. Under this pressure, a surveyor, Mr. Scott, has submitted a plan of economy that seems very tempting at first sight—to abolish the macadamized road, and substitute the stone pavement that was removed more than thirty years ago to make way for Macadam's new system. To do this will require a loan of £50,000, which he proposes to repay in thirty years. On roads where the traffic exceeds a certain amount, the interest on the first cost, including an annual sinking-fund to replace the capital, will come to less than the annual cost of keeping a macadamized road in perfect order. But the good is not unmixed; where there are shops the noise is so injurious to trade that shopkeepers abhor pavement. In Regent Street the Macadam system has been maintained against the advice of the road surveyors by the resistance and partly at the cost of the shopkeepers. As regards all fast traffic, and especially the omnibuses, the loss entailed by stone pavement is very serious. Horses are early worn out by the perpetually hard service. In frosty and greasy weather the falls and other accidents to horses are a serious item of expense. For these reasons, the proposal made in the interest of economy will not be accepted without resistance on the part of the horse-owning and shopkeeping public; and it will require nice calculation to decide where, with the most advantage, solid granite shall supersede broken stones.

The Royal Agricultural Society is growing exceedingly rich, and some of the Council do not see the meaning of constant investments in the Three per Cents. All sorts of prizes having been given for animals of every agricultural kind, except the labourer and his ass, the society has now turned its attention to raising some young prize farmers. Sums of money have been placed at the disposal of the Oxford Middle-Class Examiners to premium the competitors who display the best acquaintance with the processes connected with agriculture. We do not expect any very remarkable result from this praiseworthy attempt. Farmers sons get the same sort of education that the sons of other men in the same class get—that is, a very bad one, unless they have the good fortune to live near the English schools of Bedford or Birmingham, or some other of the few towns where English schools of a superior class have been grafted on old foundations. The Masters and Governors of the King Edward Schools in Birmingham have accommodated education to a class of scholars the majority of whom are not intended for a University career. We are inclined to think that if the Royal Agricultural Society wish to produce the greatest effect on agricultural education, they will endeavour to encourage not scholars, but schools. An examination by competition finds out clever boys; clever boys can and do learn anything to get a prize; but the national want is for middle-class schools, where boys of average intellect shall be well taught, and taught how to learn.

What competition and examination will do for scholars is being tried by the Examiners of the Science and Art Department on the students of schools for the working classes which receive aid from that department. We can scarcely expect impartial reports, although they are no doubt thoroughly honest, from gentlemen who are the offspring of the system; yet we gather some idea of the difficulty of making literary bricks without straw. We should like some close observer—some special commissioner—to follow a small per centage of the two thousand examined at home, and note their career, were it only for twelve months, to learn how much real love of science and literature there was in the prize students. Mr. Ramsay reports that some of the pupils could scarcely spell, and others had obtained their education so late that their minds seemed incapable of receiving the ideas of the teacher. Why this is just the complaint of the professors of the Royal Agricultural College, Cirencester. They found that the majority of their pupils, so far from being able to profit by a lecture, could not write from dictation, and had not the faintest idea of the elements of scientific information. When a young man of nineteen does not know the difference between fulcrum and lever a tutor has hard lines. Peasant boys have good schools open to them, so have those who can pay £100 a year for each son, but the ordinary school selected by the thriving grazier or butcher is generally best seen at dinner time; modern schoolmasters find good feeding pays better than sound learning.

A majority of the Metropolitan Board of Works have decided that £6000 shall not be paid to Mr. Bazalgette to compensate him for his inadequate salary during the time that he has carried out the main drainage works and planned the Thames Embankment. The main drainage will cost over £4,000,000, and the Thames Embankments, on both sides, as much more. Mr. Bazalgette commenced with a salary of £800 a year, subsequently increased to £1000 a year, and finally to £1500. The Metropolitan Board require engineering skill of a high order, as well as special knowledge, only to be obtained by experience. They require a man who will advise on questions where the course often lies between a large and a small expenditure, and where the interests of contractors is in favour of the larger outlay. They require a man

entirely devoted to public interests on questions where contractors and dealers in material have it in their power to offer enormous bribes for a favourable decision. The Metropolitan Board needs not only integrity, but anxious zeal. Mere indifference on the part of their engineer may cost them tens of thousands. Therefore, without considering whether it is just to get work out of a professional man for hundreds of pounds, which, executed for private individuals, would cost thousands, we maintain and can prove that it is not commonly wise to treat an officer, who is practically irresponsible, in such a manner that he has nothing to hope for doing his duty well, and nothing to fear from doing it carelessly. For a board to lose by a penny-wise hard bargain, it is not necessary that the engineer or architect should be positively dishonest, that he should go into secret partnership with contractors, and have an interest in purchases of iron, timber, and stone. He has only to arrive at the state of feeling that he has got out of his board all he can ever expect, and that he has henceforth to conciliate people who are not his masters, and who may at some future time be his customers. If the additional remuneration proposed to be bestowed on the engineer and staff of the Metropolitan Board by the minority is an illegal disposal of funds there is no more to be said. But that was not the telling argument of the majority. They stuck to the pound of flesh, and laid down with truly parochial eloquence the falsest principles of economy —"buy as cheap as possible, hold tight your officers to the "hardest bargains, and spare the ratepayers the infinitesimal tax "involved in a distribution of ten thousand pounds over the "property of the richest city in the world." Amongst the loudest of these penny-wise economists are the most indefatigable jobbers in parishes and municipalities. The objector-general to every increase of salary to every clerk, and every pension to a worn-out officer, in the Common Council of London, is a tradesman who has administered very large affairs with doubtful success. As chairman of the Metropolitan Markets Committee he exercised enormous patronage, and had an opportunity of showing his talents as an embryo Chancellor of the Exchequer, and a future Commissioner of Public Works. If we are to believe what we hear in the City from his successors, the administration of this economist exhibits, to speak mildly, every blot which he himself would expect to find in "a bloated aristocrat of the most Tory principles"—extravagance in every department, patronage in appointments grossly abused! The Common Council are wonderfully loyal to each other; priests could scarcely be more anxious to hide the faults of brothers of the robe; and yet it has become notorious that the chief occupation of the Metropolitan Markets Committee, during the last twelve months, has been to undo the doings of the economical ironmonger.

Sir Joseph Paxton is dead, full of honours if not full of years. He began life the son of a poor farmer—a gardener's boy—he died a Member of Parliment, in free and friendly intercourse with every one worth knowing in all ranks of educated society. If he was not a man of genius he was very near it. On every subject to which he paid attention he had ideas worth listening to. His head was so noble and intellectual in its character and size that he attracted attention the moment he took off his hat in any crowd. He was one of the kindest, the most hospitable, of men; full of enthusiasm for every possible improvement, with great taste and wonderful fertility of invention. He was always ready to help humble merit, and although intensely fond of talking, listened most patiently to a poor man's tale. As a landscape gardener he was unrivalled; as an architect he produced a revolution in public buildings. His greatest work, the Crystal Palace, with its gardens, will every year bear witness to his skill and taste, and be still growing into beauty when his remains are dust. He will be much missed in every grade of society, Seldom has a man so much flattered been so little spoiled.

There has been lately created a species of excitement amongst the hereditary legislators of our country with respect to the effects of certain measures introduced with the view of protecting the public health, by the report of the inspector of the Alkali Act, and by the discussion which took place on the occasion of reading the Bill for permitting the Imperial Gas Company to extend their works at Fulham. The tendency of this excitement is, it is to be feared, decidedly unfavourable to the freedom of industry, and it will no doubt result in the adoption of such measures as will render the manufacture of gas in particular impossible within what may be considered habitable districts; for the speeches of Earl Grey on the occasion of the Imperial Gas Bill, and of Lord Derby, on the occasion of the presentation of the report mentioned, both of them contained direct attacks upon what was, in fact, the freedom of industry. There are many points of view from which the question involved in the decision of this freedom may be considered, and as many of them have been lost sight of in the course of the late discussions, it seemed to us necessary at least to call attention to them before our Legislature shall have compromised itself in adopting a decided course upon the subject.

We would observe that the report which the inspector of the Alkali Factories Act has published, displays at the first glance a singular state of things. It would appear that the manufacturers of alkali allowed the fumes of the muriatic acid, given off in the process of that fabrication, to escape, although that escape was attended by a positive loss to them, and might have been easily prevented. The conduct of the manufacturers is under these circumstances simply inexplicable, especially if their factories were situated in the neighbourhood of landed proprietors, who were disposed to set in motion the powers with which the law arms any one against the nuisance trades. There could have been no difficulty in compelling the makers of alkali to apply the best means of condensing the vapours arising from their works, if all that Dr. Angus Smith, the inspector under the Alkali Act, has said be correct; at any rate the effect of the legislation in this matter has been but to relieve the landed proprietors of their duty, which certainly was to have compelled the manufacturers to have employed the best means in their power to have abated the nuisance arising from their works. We are, however, rather inclined to doubt the flattering picture that Dr. Smith draws of the effect of the condensation of the fumes of the muriatic acid. The observations of Dr. Smith have been, it is true, conducted with a remarkable degree of care and skill; they have been, moreover, characterized by a sincere desire, on his part, to ensure the efficient working of the Act, at the same time that they have been directed towards the advancement of the interests of the manufacturers themselves; but, for all that, we cannot but regard it as a too favourable view of the case to assert, that in the space of only one year, "the whole of the large alkali factories were brought within a compliance with the demands of the Act."

But if the terms of the Act be indeed complied with, it seems to us to open the door to great frauds, and to great bribery, on the part of the various officers and manufacturers concerned. It is provided that "every alkali-work shall be carried on in such a manner as to secure the condensation, to the satisfaction of the inspector, derived from his own examination, or from that of a sub-inspector, of not less than 95 per cent. of the muriatic gas evolved therefrom." As long as this power is in the hands of a conscientious man, like Dr. Smith, it is probable that it will not be abused; but directly it falls into bad hands, like those of so many of the inspectors that we have seen employed to carry into effect the sanitary legislation of late years, it is fearful to contemplate the mischief that may be inflicted by the wording of this Act that is now held up for our admiration. It is provided that the condensation shall be carried out to the satisfaction of the inspector, or upon the report of his sub-inspector; but there is no appeal from his decision, and no tribunal authorized to control the proceedings of these officers, or to compel them to adopt any measures to ensure the fulfilment of the conditions prescribed. The manufacturer and the public alike are left powerless in the hands of the inspector and his subordinate officer, and they may at their will interfere with the operations of trade, or legalize the carrying it on in any way that they may think proper. As the sub-inspectors are not likely to be men above receiving a bribe, it follows, almost as a necessary consequence, that the manufacturers will be allowed to conduct their business in the way that shall be satisfactory to those empowered to control them, to the utter contempt of the spirit of the Act, or to the interests of the neighbouring landowners, who will be prevented, by the very existence of the powers they have thus created, from any recourse to the provisions of common law. It is to the creation of motives to bribery, on the part of manufacturers and inspectors, that we think the greatest exception can be taken to the terms of the Alkali Act; even if we admit that there was any necessity in this case for a special legislation for the regulation of the trade, which we contend there was not, in spite of Lord Derby's passionate appeals to the House in favour of the measure.

The danger of these attempts at bit-by-bit sanitary regulations is, however, to be found in the tendeney of superficial observers to introduce them as occasions may arise that seem to call for them. Thus we think that we discover in Lord Grey's remarks upon the Imperial Gas Company's Bill a desire on his part to place the gas-works under the inspection of Government officers, or at least under that of the Board of Works; even if his lordship did not advocate the performance of the service of gas by the municipality. It is often said that the manufacture of this article, which is now a necessity of life, is attended with a nuisance prejudicial to the health and life of the dwellers in the neighbourhood where it is carried on; but this assertion is by no means proved—nay, on the contrary, the conditions under which the City Gas Company have conducted their works for a long time show that the manufacture of gas can be conducted in such a way as to effectually put a stop to the emanations from it that might be of a disagreeable or a dangerous character. If this be so, there can be no necessity for anything like an exceptional legislation for the class of works under consideration; as the sanitary inspectors could compel the observance of the best practicable methods of manufacture, or the neighbours could indict the gas companies who might fail to adopt those processes. The argument that the gas companies would find it to their interest to break the law, and to divert into the water-courses their foul matters, or to employ bad methods of fabrication, will not apply in this case; for at the present day the conversion of the refuse from gas-making is a source of profit to the companies, and the processes of purification are so much improved that it may be taken as an axiom that the companies that allow any thing to escape are injudiciously managed, or that they are to blame if they allow any emanations from their works. The avowed tendency of the Alkali Act was to enforce upon the manufacturers a system of condensation, which was a benefit to them, and a source of relief to the neighbours; it is not even pretended that any process exists by which the manufacture of gas would be similarly benefited, nor is it proved that it is conducted in such a manner as to be the source of undeniable nuisance. On both these grounds, then, we think that the adoption of the inspection by Government, or municipal, officials would be inadvisable, even if precautions were taken to ensure their rigorous fulfilment of their duty, and if the onus of keeping the companies within the limits of the law were not withdrawn from the regularly appointed guardians of the public health, or from the parties entitled to take proceedings against the companies.

The Bishop of London made use of some arguments in opposing the second reading of the Imperial Gas Bill, which were characterized by a spirit of unfairness that, we confess, surprised us, emanating, as they did, from such a man. His lordship sought to show that the City Gas Company was disposed to take advantage of its position by asking for enormous compensation from the Board of Works, that is now obliged to alter the plan of the Thames Embankment, and to suppress the access that they had provided for that factory. This was altogether beside the question, we would observe; for the City Gas Company did but ask compensation for the works which they had executed in pursuance of the provisions that were contained in the very Act of Parliament that empowered the Metropolitan Board to execute the quay; and if any party is to blame in the matter, it is clearly those who consented to the execution of the quays as they were first designed, not those who have availed themselves of the rights secured to them. The policy of the Bishop of London seems to be "to "throw mud," in the hopes that some of it may stick; the attack made upon the City Gas Company seems to us to be of this character, and to have been introduced merely for the purpose of creating a prejudice against every similar enterprise.

It is a necessary condition of human affairs, it seems, that the enjoyment of rights should always be attended with the necessity for defending them; and so the gas companies must be prepared to do battle for their right to conduct their industry in the best known manner that is generally admitted. The hungry seekers after place and pay will always attack bodies like these, that lend themselves so easily to the criticisms of their opponents by the casual negligences of their *employés*, or by the apparent injustice of the monopoly they exercise. But the public ought to be warned of the danger of exposing anything like a private industry to the effects of special legislation, that is, in the end, sure to defeat its own objects, like the Alkali Act; and, at any rate, to pause before it imposes on the exercise of any industry burthens from which analogous trades are free. The gas companies, in the meantime, ought to be forewarned of the intention of the "sanitary reformers," as those parties think proper to call themselves, to submit them to a similar inspection to that of the alkali manufacturers. Will they be forearmed, or will they collectively resist the application of such a system?

Circular to Gas Companies.

A FULL report of the proceedings before the committee of the House of Lords on the United General Gas Company's Bill is inserted in our present number, and it may be difficult, on perusing the evidence in this case, as it sometimes is in courts of law, to divine the causes which led to the result. The object of the Bill was to place the supply of gas in Dublin on a more satisfactory basis, by giving further powers to one of the companies who now light that city, and to confer on them at the same time the authority of Parliament for their operations. The company may have been unfortunate in some of their earlier efforts to establish themselves in Dublin and elsewhere, and may have paid more for the undertakings they purchased than the works were worth; but it was proved that their existing works are in an efficient state, and that their present value amounts to the large sum of £315,000. The company were willing to accept whatever rate of dividend on their nominal capital—applied to the undertaking in Dublin—that Parliament might consider reasonable, and to give the public the protection of the Gas-Works Clauses Act. It was shown that the gas supplied by the company has hitherto given satisfaction to the consumers, and they consented still further to improve its quality, so as to supply 14-candle gas in Dublin at the same price that 12-candle gas is charged throughout the greater part of London. The company expressed their willingness to comply with any reasonable proposition; they consented to have the nominal capital on which dividends were to be received reduced upwards of £100,000, and they placed themselves entirely in the hands of the committee. In consequence, however, of the somewhat anomalous position in which the United General Gas Company are placed—their general capital being apportioned separately to the management of works in different towns—their capital account is involved in some apparent perplexity, and the settlement of the amounts to be applied to each undertaking threatened to be a work of time and trouble. At least so it was made to appear by the counsel for the Commercial Gas Company, who contended that it would be necessary to disentangle Dublin from Limerick, and Limerick from Dublin, and how that was to be done, he said, was a most difficult question to solve; he further alleged that the alterations required to be made in the Bill were so enormous, that the committee would have full grounds for postponing it until an opportunity was given to the promoters to rearrange the whole. Whether their lordships recoiled from the prospect of a prolonged inquiry thus placed before them on the eve of Whitsuntide, and availed themselves of a technical defect in the preamble—which they had the power to correct—to throw out the Bill, it is not for us to surmise. It might be that, knowing there are competing schemes for the supply of gas to Dublin, they thought it better to defer the inquiry until next session, when all the parties may be before Parliament. Whatever might be the motive which induced the committee to reject the Bill, the unusual accompaniment to the declaration that the preamble was not proved, "even on the showing of the witnesses, and "therefore they do not require any evidence on behalf of the "petitioners," appears to intimate something more than generally is intended in the announcements of the decisions of committees.

The success of the opposition to the United General Gas Company's Bill was reported to a meeting of the Dublin Corporation, on the 5th inst., by Sir John Gray, who indulged in a variety of assertions with that random recklessness which seems habitual to those who address public meetings in Ireland. He adverted again to his experiments with burners, and he stated that the extraordinary results which he announced at the meeting of the Corporation in February last, had been confirmed by a committee of scientific gentlemen; adding, in an off-hand Irish way, that the evidence of Mr. Barlow before the committee es-

tablished "the very principle for which he ventured to contend." It requires a fervid imagination to perceive in that evidence any such confirmation. The substance of it, with respect to burners, was that the illuminating power of gas is increased as the pressure under which it is burned is reduced; that the same gas burned under one pressure will give one illuminating power, and burned under another pressure it will be different; and that the best results are obtained with a flagging flame. As regards the different qualities of gas, the claim of Sir John Gray to the entire concurrence of Mr. Barlow in the results of his experiments, rests on the statement that 18-candle gas gives to the consumer through the bat's-wing burner the full benefit of the flame, and that up to 18 candles the advantage is in favour of the Argand. Though this is strictly true, the difference is inconsiderable with 14-candle gas, and it is far from confirming or giving countenance to the extraordinary differences in the results as shown in Sir John Gray's experiments. Before he again ventures to deliver a lecture on gas-burners or on the quality of gas, he would do well to study the admirable paper by Messrs. Audouin and Bérard, "On the "different varieties of Burners used for Gas Lighting," a translation of which appeared in our JOURNAL in 1862; for it explains many of the apparent inconsistencies and anomalies which to his uninstructed mind were incomprehensible. Mr. Hawksley on a recent occasion produced a 15-hole Argand burner that complied precisely with the description usually inserted in Acts of Parliament, but 12-candle gas burned by it gave only the light of 3 candles. Messrs. Audouin and Bérard also found that "the same quantity of gas when burned "in a good (bat's-wing) burner may give four times the "quantity of light it would do when burned in a bad burner," and Sir John Gray will, no doubt, do the same under similar circumstances. The general law, which applies to all sorts of burners, as determined by the researches of those gentlemen, is, that "the greatest illuminating power is ob-"tained with feeble pressures;" and it results from this law that, whatever may be the form of the burner, a uniform quantity of light may, by placing it in certain conditions, be obtained in burning the same quantity of gas. By manipulating experimentally with burners, very different illuminating effects may be produced from those that result in the ordinary combustion of gas; and it is possible that even so intelligent an investigator as Sir John Gray may, from the want of experience, be entirely misled by his experiments without knowing why, and they may prove as worthless for practical purposes as those of our friend in the Borough, who undertook to determine the cost of gas making by experiments in a tobacco-pipe. Sir John mentioned to the Dublin Town Council that some "most friendly intimations" had been sent to him to the following effect:—"You have made some little "reputation in connexion with the water question; you have "gone out of your depth in the gaseous material, and for the "sake of your reputation do not venture to go before the "committee of the House of Commons, or you will be "torn to pieces." We are glad to find that he has such judicious friends, and strongly recommend him to follow their advice.

Sir John Gray has, indeed, gained some reputation in his successful endeavours to improve the supply of water to Dublin, and he is, no doubt, quite right in attempting to procure for the citizens a supply of good and pure gas; but the experience he has already gained must have taught him that it is not so easy a matter to obtain the best possible supply of gas as it was to provide an abundant quantity of excellent water. The rainfall on the Wicklow mountains affords a most ample and never-failing quantity of soft and wholesome water; but the known seams of cannel coal to which he must look for raising the illuminating power of the Dublin gas from 13 or 14 candles to 20 candles, are being rapidly exhausted by the local demands on them, and any increase in the demand must be followed by a rise in price. The best description of Boghead, when first brought to market in 1851, was 16s. a ton; it is now 45s., and as the limited supply becomes more diminished the price will be further advanced. It is calculated that at the present rate of demand the stock of cannel available in England for gas purposes will be exhausted in 20 years, and, with that contingency in prospect, it becomes a question whether it be just and reasonable to fix a standard of illuminating power much higher than can be procured from ordinary gas coal without the power to raise the price. Liverpool and Manchester alone are calculated to exhaust 50 acres yearly of the Wigan field, and Glasgow is drawing heavily on the Lanarkshire field. According to the best estimates that can be made, the present consumption of coal for gas making in the United Kingdom amounts to about 14 million tons per annum, and of cannel less than 1 million tons; but of the latter a large portion is so poor in quality as not to be worth carriage to a distance from the place where it is extracted. Indeed, after naming Boghead, Lesmahago, Arniston, Ramsay's, and Wigan, there are few cannels that are heard of beyond their immediate neighbourhoods; and Sir John Gray will do well to consider what would be the effect of a run upon so limited a source of produce before he pledges himself to obtain a supply of 20-candle gas in Dublin.

The meeting of the British Association of Gas Managers, at Birmingham, passed off in a manner highly favourable to the continued success of the new and valuable institution. There has been a considerable accession of members during the last year, and they now amount to upwards of 100. The inaugural address of the president, Mr. Hawksley, will be read with great interest. It was admirably adapted to the occasion, and, by suggesting numerous subjects on which information is now wanting, it will direct the attention of those who are in positions that enable them to prosecute such investigations successfully to the manner in which they can best pursue their inquiries for effecting improvements in the manufacture and distribution of gas. The following are the matters which he especially brought under notice as requiring further investigation. The determination of the best mode of removing sulphur in any form from gas; the conditions under which ammonia should be extracted, and the extent to which it ought to be removed from gas; the relation of the illuminating power of gas to the burners with which it is consumed; the friction of gas in pipes, and its possible increase with the time that the pipes have been laid down; and the utilization of what are termed refuse products. The president concluded by recommending that information should be obtained as to the five subject matters on which the Court of Referees on private bills adjudicate; and as to the law of rating gas-works, with a view to remove the enormous inequality which now exists between the rating of gas-works and other manufactories in the same parish. Several papers were then read and discussed, after which the members dined together, and in the evening Dr. Letheby delivered a lecture on the present state of the chemistry of gas lighting, in continuation of his lecture last year. On the following morning the officers of the association for the ensuing year were elected, thanks were voted to those who had contributed to the furtherance of the objects of the meeting, and the members spent the remainder of the day in visiting the manufactories connected with gas apparatus, and the works of the two Birmingham gas companies, which were thrown open to their inspection. We are obliged to defer till our next number the report of the papers, and of Dr. Letheby's lecture

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1447.—JEAN ALPHONSE HEINRICH, civil engineer, at Mulhouse, Rue du Faubourg de Bâle, No. 97, France, for "*A new system of rotative machines to be used as steam-engines and water-pumps.*" May 26, 1865.

1458.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, London, for "*Improvements in apparatus for measuring gas and other fluids.*" A communication. May 27, 1865.

1479.—JAMES HARE the younger, of the Lozells, near Birmingham, manufacturer, for "*Improvements in instruments or apparatus for cleaning the interior of tubes or hollow cylinders, gas-chimneys, and other hollow articles.*" May 30, 1865.

1494.—HYPOLITE MONIER, lighting apparatus manufacturer, of 29, Boulevard St. Martin, Paris, for "*An improved burner for gas and other lighting apparatus.*" May 31, 1865.

1516.—JOHN NUTTALL, manager of the works of James Nasmyth and Co., Bridgewater Foundry, Patricroft, near Manchester, for "*Improvements in valves for steam and other fluids and liquids.*" June 2, 1865.

1527.—CHARLES TAYLOR, of Birmingham, machinist, for "*Improvements in tube-cutters and screw-stocks.*" *June* 3, 1865.

1534.—THOMAS GENTLE and JOSEPH ALLMARK, of Oldham, for "*Improvements in turbines.*" June 5, 1865.

1548.—HENRY HERMANN KROMSCHROEDER and JOHN FREDERICK KROMSCHROEDER, both of 14, Church Road, Haverstock Hill, for "*Improvements in dry gas-meters.*" June 6, 1865.

1549.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, London, for "*Improvements in the construction of reservoirs for containing and storing petroleum and other oils.*" A communication. June 6, 1865.

1553.—JAMES HOWARTH, M.D., of Andover, for "*An improved method and apparatus for distilling coal, shale and other carbonaceous substances.*" A communication. June 7, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1330.—Alexander Weir, of Greenock, in the co. of Renfrew, N.B., for "*Improvements in water-gauges and cocks.*" May 13, 1865.

1334.—William Clark, of 53, Chancery Lane, London, engineer, for "*Improvements in gas-burners and chimneys.*" A communication. May 13, 1865.

1381.—George Henry Brookes, of Sheffield, for "*Improvements in sliding gas-pendants or chandeliers.*" May 19, 1865.

1386.—William Davey, of the Imperial Tar-Works, White Post Lane, Hackney Wick, London, for "*Improvements in apparatus for washing or purifying coal gas, and for producing ammoniacal water therefrom.*" May 19, 1865.

1392.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*Improvements in apparatus for raising oil and other liquids from deep wells.*" A communication. May 20, 1865.

1393.—John Ambrose Coffey, of 17, Gracechurch Street, London, consulting engineer, for "*Improvements in distilling apparatus.*" May 20, 1865.

1395.—William Smith and George Browne Smith, both of Kennington, London, gas-meter manufacturers, for "*Improvements in wet gas-meters.*" May 20, 1865.

1411.—Edward M'Nally, of Manchester, engineer, for "*Certain improvements in apparatus for cutting or forming screws, which is also applicable for cutting pipes or tubes.*" May 23, 1865.

1437.—George Bray, of Leeds, for "*An improved gas-burner.*" May 25, 1865.

1479.—James Hare, the younger, of the Lozells, near Birmingham, manufacturer, for "*Improvements in instruments or apparatus for cleaning the interior of tubes or hollow cylinders, gas-chimneys, and other hollow articles.*" May 30, 1865.

INVENTION PROTECTED FOR SIX MONTHS BY THE DEPOSIT OF A COMPLETE SPECIFICATION.

1494.—Hypolite Monier, lighting apparatus manufacturer, of 29, Boulevard St. Martin, Paris, "*An improved burner for gas and other lighting apparatus.*" May 31, 1865.

NOTICES TO PROCEED.

226.—Alexander Angus Croll, of Coleman Street, London, civil engineer, for "*Improvements in the purification of coal gas.*" Jan. 26, 1865.

796.—William Mattieu Williams, of the Celyn Caergwrle, near Wrexham, manufacturer, for "*Improvements in apparatus for the distillation of coal and peat, and such other substances as are or may be used for the manufacture of solid and liquid volatile hydrocarbons, or for the manufacture of the said hydrocarbons and coke.*" March 22, 1865.

237.—James Hind, of Liverpool, engineer, for "*Improvements in the construction of pumps for lifting and forcing liquids.*" Jan. 27, 1865.

447.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*Improvements in apparatus for distilling petroleum and other volatile liquids, and for making gas.*" A communication. Feb. 16, 1865.

1210.—Charles Edward Herpst, of 3, Rue Jean Jacques Rousseau, Paris, mechanical engineer, for "*Certain improvements in pumps.*" A communication. May 1, 1865.

1287.—William Jackson, of Glasgow, for "*An improved method of mixing gases and vapour, and in the machinery or apparatus connected therewith.*" May 9, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1533.—Macedo Alexandre le Brun Virloy, "*Improvements in drying and carbonizing wood, peat, and other fuel.*" May 21, 1862.

1574.—Jean André Cécile Nestor Delpech, "*Improvements in pumps.*" May 26, 1862.

1617.—Charles Denton Abel, "*Improvements in apparatus for raising, propelling, or exhausting air, water, or other fluids or gases.*" A communication. May 29, 1862.

1640.—William Thomas Smallwood and William Wright, "*Improvements in water-closets.*" May 31, 1862.

1670.—Goldsworthy Gurney, "*Improvements in apparatus for production and application of artificial light.* June 3, 1862.

1675.—James Lee Norton, "*Improvements in machinery for raising and forcing water.*" June 3, 1862.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

1245.—Robert Owen, "*Improvements in water-closets, night-commodes, or similar conveniences, and also in disinfecting processes.*" June 3, 1858.

1246.—William Clayton and Jacob Goodfellow, "*A certain improvement in pistons for pumps.*" June 3, 1858.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MAY 29.

The Drighlington and Gildersome Gas Bill.—The Commons amendments were considered and agreed to.

The Gosport Gas Bill and the Llanelly Local Board of Health Bill were returned from the Commons, with the amendments agreed to.

The Hastings and St. Leonards Gas Bill was reported, with amendments.

The Galway Water Bill was read a third time, and passed.

The United General Gas Bill.—The Select Committee reported, that it is not expedient to proceed further with the bill.

The Halifax Extension and Improvement Bill.—The Committee of Selection reported, that Lord Bolton be proposed to the House as a member of the Select Committee on this Bill, in the place of Lord Scarsdale, which was read and agreed to.

TUESDAY, MAY 30.

The Horsforth Water Bill was returned from the Commons, with the amendments agreed to.

The Belfast Gas Bill was reported, with amendments.

The West Bromwich Improvement and the Southampton Gas Bills were read a second time, and committed.

The Glasgow Corporation Water Bill was read a third time, and passed.

THURSDAY, JUNE 1.

The Carnarvon New Water Bill and the Hastings and St. Leonards Gas Bill were read a third time, with the amendments, passed, and sent to the Commons.

FRIDAY, JUNE 2.

The following Bills received the Royal Assent:—The Birstal Gas; Littleborough Gas; Brierley Hill Gas; Preston Gas; Gosport Gas; Llanelly Local Board of Health; Galway Water; Drighlington and Gildersome Gas; Horsforth Water; and Glasgow Corporation Water.

The Highbridge Markets and Gas and the Port Glasgow Police and Water Bills were brought from the Commons, read a first time, and referred to the Examiners.

The Liverpool United Gas Bill was returned from the Commons agreed to, with amendments. The said amendments were considered and agreed to.

The Ross Improvement Bill was returned from the Commons, with the amendments agreed to, with an amendment. The said amendment was considered and agreed to.

The Southampton Gas and the Merthyr Tydfil Local Board of Health Bills were reported, with amendments.

The Crays Gas Bill and the Ripon Local Board Bill were read a second time, and committed.

The Glossop Water and the Belfast Gas Bills were read a third time, with the amendments, passed, and sent to the Commons.

HOUSE OF COMMONS.

TUESDAY, MAY 30.

The Horsforth Water Bill.—The Lords amendments were agreed to.

The Ayr Water and the Tunbridge Wells Water Bills, as amended, were considered, and ordered to be read a third time.

The Leamington Gas Bill was reported, with amendments.

THURSDAY, JUNE 1.

The Bromley Gas and the Oldham Borough Improvement Bills were reported.

The Gomersal Gas Bill was reported, without amendment. To be read a third time.

The Rhyl District Water; the Gainsborough Water; and the Ross Improvement Bills.—The Lords amendments were agreed to.

The Highbridge Markets and Gas and the Port Glasgow Police and Water Bills were read a third time, and passed.

The Liverpool United Gas Bill was read a third time, and passed, with amendments.

FRIDAY, JUNE 2.

The Ayr Water Bill was read a third time, and passed, with amendments.

The Tunbridge Wells Water Bill was read a third time, and passed.

THURSDAY, JUNE 8.

The Gomersal Gas Bill was read a third time, and passed.

The Leamington Gas Bill, as amended, was considered. To be read a third time.

FRIDAY, JUNE 9.

The Belfast Gas; the Carnarvon New Water; and the Kidderminster, Stourport, and Bewdley Water Bills.—The Lords amendments were agreed to.

The Bromley Gas and Oldham Borough Improvement Bills, as amended, were considered. To be read a third time.

HOUSE OF LORDS.

(*Before the Marquis of* Sligo, *Chariman; Lord* Seymour, *Lord* Truro, *Lord* Sherborne, *and Lord* Dunsany.)

UNITED GENERAL GAS BILL.

MONDAY, MAY 22.

Mr. Hope Scott, Q.C., Mr. Burke, Q.C., and Mr. Richards, appeared for the petitioners; Mr. Barry and Mr. O'Hara appeared for the Corporation of Dublin; Mr. Stephens for the Commercial Gas Company; and Mr. O'Malley, Q.C., and Mr. Norwood for the Commissioners of Kingstown and some of the ratepayers of Dublin, Kingstown, and Dundrum.

Mr. Burke, in opening the case, said that although the United General Gaslight Company had its existence in England, still it lighted Dublin, Kingstown, and Bray, in Ireland, and in this bill they sought to maintain and extend their works in those places. At present the company was not under parliamentary regulations, but in this bill they proposed to put themselves under the restrictions of Parliament; and he thought it must be obvious that a company exercising such powers as were exercised by this company should be placed under such restrictions as had been provided by Parliament for the regulation of gas companies. Whilst he admitted that the company would not have come before the committee and promoted this bill, unless it was to give solidity to their own position, yet at the same time the powers sought for were consistent with the public advantage. Originally the company were incorporated by charter, and from time to time bought up different undertakings. They in this way became possessors of the Hibernian Gas Company, which was established to supply Dublin with gas, and they afterwards acted under the powers of that Hibernian Gas Company, and

supplied gas without any objection being made to their so doing. That was since 1823. Only last year (1864) the United General Gas Company became possessors of a little company established at Bray, which was not incorporated under Act of Parliament. He would refer the committee to the allegation in the preamble of the bill where it said, "Whereas by letters patent, bearing date the 31st day of March, in the first year of the reign of King William the Fourth, certain persons who had been carrying on business under the firm of the United General Gaslight Company, and had contracted ta light, and had lighted with gas, the public lamps of certain cities, towns, and places in England and Ireland, were incorporated by the style of the United General Gaslight Company, hereinafter referred to as the company, with power to manufacture and sell gas, and to hold lands not exceeding at the time of the acquisition thereof in any one place the yearly value of three hundred and fifty pounds sterling, and also to purchase shares in the stocks of public companies; and the capital of the said company was declared to be £500,000, to be raised in shares of £50 each; and it was declared that any money which had been already advanced should be deemed capital stock; and that all contracts not inconsistent with the laws of the realm which had already been entered into might be confirmed by the directors." The preamble then went on to state that the company had purchased, or otherwise acquired, the works, property, and shares of a company called the Dublin Gaslight Company; also the works, property, and shares of the Hibernian Gaslight Company; and of the Oil Gaslight Company; all incorporated by Act of Parliament. The Dublin Gaslight Company and the Dublin Oil Gaslight Company had for many years been in abeyance, and the powers contained under their respective Acts had ceased to exist. The company, however, had constructed gas-works in the city of Dublin and in the town of Kingstown, and by virtue of the powers conferred on them by their charter, and the powers conferred on the Hibernian Gaslight Company, they had entered into contracts for the lighting of the public streets of Dublin and the suburbs thereof, and also the district of Kingstown. Besides this, they had had transferred to them the works at Bray, heretofore belonging to the Bray Gas Company, and were lighting the town and docks at Bray; and they also possessed works at Limerick, and under these circumstances they considered it (in the words of the preamble) "expedient that the hereinbefore recited Acts and letters patent should be repealed, but without prejudice to the rights and powers of that company with respect to their gas and other works at Limerick and the neighbourhood thereof, and that the powers of the company should be confirmed and extended, and that the provisions hereinafter contained should be made for regulating the powers of the company." That was the substance of the preamble, which would have to be proved, and for his own part he could not see what opposition could be made to that preamble, although, perhaps, his learned friends who appeared on behalf of the petitioners might suggest alterations in certain of the clauses. The inhabitants of Dublin were largely increasing in numbers, and of course there was an increased consumption of gas, and it was therefore essential that the United General Gaslight Company, which had supplied the public lights satisfactorily for the last 20 years, and also many private consumers, should be in a position to meet the increased demand. During the whole of that 20 years they had never divided 5 per cent., but, on the other hand, they had largely devoted their profits to the extension of their works, and it was proposed in this bill to capitalize a portion of those profits. The corporation of Dublin were in this peculiar position—they had the power to erect gas-works. They had not done so, but latterly they had given their support to a new company, called the Consumers Gas Company, whom they wished to pit against this company, in order to make it reduce its charges. A new company, called the Commercial Gas Company, had also been started, and he believed he might state that the whole opposition to this bill emanated from that quarter. The corporation had now the power to enter into contract with other companies for lighting for three years, but it did not suit the new company to enter into a contract for that period. In order to support that new company, the corporation last year, having a bill in Parliament, sought power to extend the period of entering into contracts. This company opposed that, considering it an indirect means of giving stability to the company, which should not be as against this company; and Parliament took the same view, and the object of the corporation was defeated. The corporation could now only enter into a contract for three years.

Mr. O'MALLEY: You are mistaken in that; it is for ten years.

Mr. BURKE said they were limited in this respect: that, if they made a contract for ten years, it must be with a company authorized by Act of Parliament. This year the Commercial Gas Company sought to enter a bill to give them the necessary power, but they lost it upon Standing Orders, and therefore there was only this company which was in a position to enter into the contract. The Commercial Gas Company were not incorporated by Act of Parliament; they had no parliamentary powers to supply the gas within the limits which this company had, and under these circumstances he should, at the proper time, take their lordships opinion as to whether the Commercial Gas Company had any right whatever to be heard against the bill.

The CHAIRMAN: Who are the other petitioners?

Mr. BURKE: The corporation of Dublin, the commissioners of Kingstown, and certain ratepayers; but it will be my duty to call your attention to the allegations of these petitioners before I conclude, and I begin by stating that they are all in the interest of this other Commercial Company, who have a separate petition of their own.

Mr. O'MALLEY said he also represented the ratepayers of Dundrum and Bray.

Mr. BURKE replied that they were all in the same category. Evidence would be given that the works at Dublin were perfectly adequate to the supply of gas, and that the introduction of a new company was perfectly useless so far as the supply was concerned. He believed that recent inquiries by Parliament tended to show that it was not expedient that there should be competition by gas companies in the streets of large towns. In 1860 the metropolitan companies came to the conclusion that not only was it a waste of capital to have different mains in the same streets, but it was also very difficult to ascertain from which the escape emanated. It was also extremely inconvenient for the streets to be constantly broken up, and so the metropolitan companies arranged amongst themselves to divide London into districts, each company taking a district of its own. The United General Gas Company was in a position to supply all Dublin, and all that Dublin could require then was that the company should be placed under proper parliamentary regulation. The illuminating power fixed in 1860 was 12-candle gas, to be measured according to a certain burner, but in more recent Acts Parliament required instead that it should be 14-candle gas instead of 12. The company now proposed, in its present bill, to give this maximum illuminating power of 14; and surely if London was satisfied with 14-candle gas, there could be no pretence for Dublin to ask that it should be higher. He should bring before them evidence of the highest character to show that the gas was of excellent quality, and the supply ample. He would now briefly call their lordships attention to the petitions against the bill. [Mr. Burke here read, and commented upon, the petitions with had been presented against the bill by the Commercial Gas Company, the corporation of Dublin, and the commissioners of Kingstown and several ratepayers. The general grounds on which those petitions were presented were, that if the bill was carried it would give a monopoly to the company which would be highly prejudicial to the interest of the gas consumers, and that at times the supply of gas by the company had not been satisfactory.] He contended that in these petitions there was nothing whatever against the preamble of the bill. The company were already satisfactorily supplying gas to Dublin, and what they now sought under the bill would be of advantage to the public, for what they wanted, as he said before, was to place themselves under an Act of Parliament which would limit the amount of dividend, ensure a certain illuminating power, and give to the authorities the power to test the gas, which it was obvious must be a great advantage to the consumers.

The CHAIRMAN: Does it limit the dividend?

Mr. BURKE: The General Act says 10 per cent. Perhaps your lordships will come to a decision first of all with respect to the *locus standi* of the Commercial Gas Company?

The CHAIRMAN: You do not object to any of the others?

Mr. BURKE: No my lord.

(Mr. Stephens then rose to address their lordships with respect to the right of the Commercial Gas Company to be heard, when the chairman suggested that perhaps it would be better to wait till some question arose affecting the Commercial Company. Mr. Stephens acquiesced in this suggestion, and the examination of witnesses was then proceeded with.)

Daniel William Ogg, Esq., examined by Mr. RICHARDS.

I am secretary to the United General Gas Company, and have been so for 17 or 18 years. I produce the charter which was passed in the year 1831. The company have works at Dublin, Kingstown, and Bray, and also some at Limerick; but with the Limerick works we are not concerned in this bill. The works at Dublin are, I believed, carried on under the name of the Hibernian Gas Company. The object of this bill is to place the company under the operation of the Gas-Works Clauses Act; more beneficially than under the other Acts which have been recently passed. The various titles of the Acts, as recited in the preamble of the bill are, "The Dublin Gas Company," "The Hibernian Gas Company," and "The Dublin Oil Gas Company;" and we have acted under them on various occasions—such as sueing and being sued under the Hibernian. We purchased the Dublin Gaslight Company about the year 1824 or 1825, the Hibernian about the same time, and the Oil Gas about 1836. I have minutes detailing the circumstances under which those several companies were purchased. The Hibernian Company carried on the duties which they had previously performed; they traded in Dublin under the name of the Hibernian Company. Originally, the United Gas Company lighted Dublin, Limerick, Cork, and Plymouth.

The CHAIRMAN: Why do they call themselves one name in one place and another name in another place?

Witness: We took possession of the works of the Hibernian Company at Dublin, and I presume that is the reason. All our powers in Dublin were derived from the Hibernian Acts.

The CHAIRMAN: What were they called before they bought the Hibernian Gas-Works?

Witness: They existed for six or twelve months, I think, as the Hibernian Gas-Works.

Examination continued: I believe it was in the year 1835 or 1836 that we purchased the Oil Gas Company; and about twelve months ago we purchased some small works at Bray.

Mr. RICHARDS: During the last 10 years, what has been the dividend you have paid upon your capital expended in Dublin?

Witness: We have not paid it on the Dublin—we have paid it generally; it has been possibly under 3 per cent., or from 2½ to 3 per cent.

Mr. RICHARDS: What is the capital you have actually expended in Dublin?

Witness: We have expended out of shareholders capital the sum of £360,000.

Mr. RICHARDS: In addition to that, have you expended any capital derived from accumulated profits?

Witness: We have expended over £60,000, or say £60,000.

Mr. RICHARDS: In Dublin and Kingstown?

Witness: Yes; and upon the works at Bray we have expended £5000 in the last twelve months; making altogether £425,000. The company is an English company, and the board sits in London, receiving reports from Dublin weekly at least. Once or twice a year they visit the works. They have a resident engineer upon the works, and also an agent, who is constantly employed. The work of the board in London is principally for contracts and such matters.

Mr. RICHARDS: You have mentioned the sums which have been expended in the last few years—can you give us the annual amount which you have expended?

Witness: It would be as nearly as possible, *pro ratâ*, about £5000 to to £6000 a year for 12 years, I should say.

Cross-examined by Mr. O'MALLEY: I have stated that the company carries on its business in London, and that the board meets in London. It meets weekly. There are also half-yearly meetings of the company, which are held at Austin Friars. The advertisements of the company are published in London and in Dublin. We also send, out of courtesy, circulars to the proprietors, convening the meeting.

Mr. O'MALLEY: What do you mean by sending them out of courtesy to the proprietors?

Witness: The charter mentions London newspapers—three London newspapers; so by the charter we are only obliged to publish in three London newspapers. I think we also publish in the Dublin newspapers, but I fear I cannot mention the name of one now. I have stated that we sometimes send circulars to the proprietors out of courtesy; we send them to the whole of Ireland. Possibly there are not more than forty-five or fifty proprietors in Ireland, and the capital they represent is from £5000 to £6000. The total number of our shareholders is 400, more or less. As secretary, I reside in London, but I visit Dublin once or twice a year. Our manager at Dublin is Mr. Sanders, and the amount of his salary is, I think, £700 a year. We have a resident engineer, Mr. Romans; he has been our engineer four or five years. Before that we had Mr. Saunders, who officiated with a sub-engineer, but the business progressing very rapidly and extending, it was found better to have a local engineer. We were originally established with a capital of £500,000, with £450,000 paid up. £500,000 was the nominal capital.

Mr. O'MALLEY: I see by your bill, or your amended bill, that there has been paid up £475,000.

Witness: Yes, including what we seek now to capitalize out of profits.

Mr. O'MALLEY: No; exclusive of what you capitalize, £470,000; you say that there are 450 shares.

Witness: 9000 shares, at £50 a share.

Mr. O'MALLEY: 9500 shares have been fully paid up.

Witness: 9000 only.

Lord SEYMOUR: I think it should be 9500.

Witness: No.

Mr. O'Malley: I see by your proposed bill you seek to capitalize, against the inhabitants of Dublin, £365,000, and to capitalize £60,000 out of profits.

Witness: Yes.

Mr. O'Malley: You propose to raise, by shares, to be allotted amongst the proprietors, £50,000 more capital.

Witness: Yes; £50,000 further capital.

Mr. O'Malley: You seek to capitalize, as against the consumers of Dublin, a sum equivalent to the whole sum paid up on your shares of £475,000. You say that £450,000 is the amount of your capital paid up in shares. I accept that as such; then you add your works at Plymouth. How long did you carry on those works at Plymouth?

Witness: I hardly know the commencement of them. The works at Plymouth were carried on before I was in the company's service; possibly, according to my recollection, they may have been carried on 10 or 15, or 20 years. The Cork works we have carried on for 25 years.

Mr. O'Malley: May I ask when you went out of Plymouth how much you got paid by the company taking your works?

Witness: It is a matter of recollection with me at this moment without reference, but, speaking from recollection, it would be about £30,000.

A Lord: How much did you expend there?

Witness: We received £30,000.

A Lord: How much did you pay?

Witness: More than that, do you mean?

A Lord: How much was actually laid out?

Witness: £45,000 or £47,000.

Mr. O'Malley: That is altogether?

Witness: Yes.

A Lord: Do you mean £47,000 in addition to £30,000?

Witness: No.

Mr. O'Malley: Did you lose only £17,000 in Plymouth?

Witness: On the capital account about £17,000, in round numbers say £20,000. I do not think it was more than that. The accounts are not here; the notice was served on Thursday or Friday last. The notice is not here at this moment; it is in the city I take it. In Plymouth we carried on the works under a charter only. They were sold to the Plymouth and Devonport Company.

Mr. O'Malley: Now, referring to Cork, what do you estimate your loss at; the losses altogether, take them first?

Witness: Do you mean loss on capital invested, or on sale?

Mr. O'Malley: All your loss on Cork; the loss on capital invested, take that first.

Witness: £18,000. We still carry on our works at Limerick; they are carried on under the charter. We are under no limitation there as to the amount of dividend that we take upon the capital; we act under the charter. We have accounts showing how much money has been laid out at Limerick. We have separate accounts of the expenditure of capital in Cork, Plymouth, and Limerick. The capital, as against Limerick, stands at about £18,000 or £20,000.

Mr. O'Malley: Do you mean to say that from £18,000 to £20,000 capital invested you supply the whole of the city of Limerick?

Witness: Not the whole of it. We are limited to a certain portion of the city. There are corporation works. In order to supply the entire city it might cost us from £3000 to £4000 more. We have bought up many companies; for instance, the Dublin Gaslight Company; the sum we paid for that was £80,000. For that amount we got the works, the plant, the goodwill, and the customers. We have never used the Dublin Gaslight Company's works; they are on the north side. We have used the mains. We use very little of them possibly at this distance of time; we have had to take many of them up. For the Dublin Oil Gas Company we paid about £42,000.

Mr. O'Malley: Are you using any of their works?

Witness: We are using a building or two; no gasholders, no retort-house, no mains—at least, very few mains. The building or two consist of meter-shop and storehouses. I cannot exactly give the valuation of them. They are not worth £41,000; but the principal feature with the Oil-Gas Company was the goodwill.

A Lord: Are they worth £10,000?

Witness: No, they are not.

Mr. O'Malley: Are they worth £1000?

Witness: There is a species of freehold; there is a long lease; but altogether I really cannot answer within a thousand or two. It is impossible for me to do so from the nature of the property. The great feature of the purchase was the goodwill. We are using the Hibernian Gas Company's works. It was in January, 1847, that I began as secretary to this company, and therefore I remember the inquiry that was made under the auspices of Lord Morpeth in Dublin, but not the features of it particularly.

Mr. O'Malley: Then you scarcely can have forgotten the strong condemnation of your works, and of everything connected with them?

Witness: I take it to have been a species of party condemnation at the time.

Mr. O'Malley: In which Lord Morpeth was a party?

Witness: I did not say that; but the parties who visited the works.

Mr. O'Malley: However, the commissioners did most strongly condemn your works?

Witness: I have read the condemnation.

Mr. O'Malley: It is signed by Lord Morpeth and A. Milne, Esq., Commissioners of Her Majesty's Woods and Revenues?

Witness: The details are given by two engineers in Dublin, to whom the matter was referred.

Mr O'Malley: Do you remember their reporting—"That in the first instance by successive purchases of rival companies (and at prices which, assuming £300,000 to have been expended, must be pronounced extravagant), and more recently by the effecting, under most singular circumstances, of the contract for the public lights with the Paving Commissioners, the Hibernian Company has not only enjoyed for a great number of years a complete monopoly in the supply of gas in Dublin and some of its suburbs, but has with much skill endeavoured to perpetuate this monopoly for some years to come. This contract with the Paving Commissioners binds the Hibernian Company to supply about 2800 public lamps, each consuming about 4 cubic feet per hour, lighted during twelve hours per night on the average of the year all round, at the rate of £3. 1s. 8d. each lamp, finding lamp posts, lanterns, &c. &c., with cleaning, lighting, and extinguishing. If these charges, with interest of capital, be taken at 20s. per lamp, there remains only a sum sufficient to cover a price of 2s. 4½ per 1000 feet of gas consumed in the public lights. But, further, as the Hibernian Gas Company is stated to have expended £300,000 in the purchasing up of rival companies, and as a complete gas establishment (works and mains) competent to supply 200 million cubic feet of gas per annum may be constructed in Dublin for an expenditure of £140,000 (see estimate No. 1), it follows that, upon the difference between this capital and the £300,000 actually expended, the company must be constantly paying a wasting interest." Do you remember that?

Witness: I remember the estimate, but I think the facts do not bear the estimate out in another sense.

Mr. O'Malley: Do you remember it being stated that your works were of the worst possible description, without any plan or any arrangement?

Witness: I remember the observation as to their being without plan, but I do not know about being of the worst possible description, seeing that we had supplied the public lighting very beneficially at the time, and that we were able to comply with the requirements made upon us.

Mr. O'Malley: This is what I meant—"The Hibernian Gas Company's works are old, constructed upon no uniform plan, and subject to all the inconvenience arising from works added piecemeal from time to time."

Witness: Up to that period. Since that time they have been much improved; the expenditure of £60,000 has improved them very materially. It was antecedent to the year 1847 that you are reading.

A Lord: What is the date of the document you have been reading from?

Mr. O'Malley: 1847, my lord.

Witness: But there is a subsequent report rather of a different nature—a second report, not of those parties, and made two years afterwards.

Mr. O'Malley: By whom was it made?

Witness: It was a report that was made about the water of the corporation.

Mr. O'Malley: We are dealing with gas.

Witness: They touched upon gas. Our works are in the same position now as they were then. They have not been added to piecemeal, but they have been improved in a very comprehensive manner. A good deal has been pulled down and rebuilt.

Mr. O'Malley; What has been pulled down and rebuilt?

Witness: I will say the retort-house. Then, to meet the supply of the public, we have three large gasholders. Since 1847 we have expended £60,000.

Mr. O'Malley: At that time, when you were so much condemned, you were producing gas equal in illuminating power to 17 candles?

Witness: I have no record of that; that must be hearsay, I think. We had no photometer in those days. Mr. Holloway was our engineer then. He may have stated that our illuminating power of gas, in an Argand burner consuming 5 feet per hour, equal to 17·15 sperm candles was produced, but he had no instrument then to test it. We use from 7 to 8 per cent. of cannel coal in making gas, but I am now speaking from general knowledge. About £6000 or £7000 was the last statement that I looked at as capital held in Ireland; about two-thirds of that is in Dublin. Our shares have been at a discount for 20 years, until recently in the last four or five years. This is not an unusual thing with a company; it was so with the London companies four or five years since. Something in the enormous amount of the capital may have had something to do with it. The population of Limerick is about 45,000. The population of Dublin is 250,000; taking it from the census. I take it that in Dublin there are more customers for gas than in Limerick; they do not seem to take gas in proportion in Limerick as in Dublin. We should want more capital to supply Limerick than Dublin.

Mr. O'Malley: Can you tell me the limits you propose by this Act; they extend on one side, I think, to a place called Finglass at one extremity, and Bray at another?

Witness: Yes. I cannot tell the distance from Bray to Finglass; I do not know the locality. Another witness who will be called will tell you all about Dublin. The district now supplied by us is about 17 linear miles. We propose to supply nearly all the county of Dublin. With respect to our works at Kingstown, they are situated about three quarters of a mile inland. As to the elevation, that is an engineering question which I must decline to answer; the supply is perfect at this time, and the pressure is ample for everything. There is low ground which is well supplied.

Mr. O'Malley: There is a company already existing there?

Witness: Not already existing.

Mr. O'Malley: Is there not a company already there?

Witness: I believe there are premises taken with some pipes lying there—one or two.

Mr. O'Malley: Is there a company there?

Witness: The company has put in for a public lighting contract, and they have got it.

Mr. O'Malley: Is not that an existing company?

Witness: Without works.

Mr. O'Malley: Do you know that it is a company?

Witness: I have heard of it. The pipe or two which I have spoken about lie in the hollow way now; I do not know that those pipes lighted any streets.

Mr. O'Malley: Do you not know that this company, which you say has a pipe or two, have ten miles of mains laid down?

Witness: Not in the hollow; not at Kingstown.

Mr. O'Malley: I ask you about Kingstown?

Witness: Not at Kingstown; they have not ten miles of mains there.

Mr. O'Malley: Where have they any?

Witness: I think it is far inland; two or three miles in an agricultural village. The name of that village is Dundrum. The company have works, and consequently they have mains. I am aware that that company is under a contract to supply Kingstown with light—it is a contract with a penalty. They have no parliamentary powers in Kingstown, nor have we.

Mr. O'Malley: Has it never entered into your contemplation that if you obtain these parliamentary powers this session you could turn round and indict them within three weeks afterwards for opening the public roads?

Witness: You tell me that as a point of law; I am informed by you thereof.

Mr. O'Malley: You know, I presume, the Sheffield Gas Company's case, and that without parliamentary powers the commissioners cannot give you power to commit a nuisance by breaking up the public streets, and that is the object of coming to Parliament?

Witness: One object was this: we thought that we could light Kingstown under the Hibernian Act; that is now dispelled.

Mr. O'Malley. I should like to know this: the Commercial Company were coming for a bill this time to Parliament?

Witness: They were; and they gave their notices last session. As far as I know the board, it was not the knowledge that they were coming to Parliament which induced us to give notice too. We thoroughly opposed this bill in Standing Orders; on a technical objection as to the nonconformity of their notice with their bill, they were thrown out.

Mr. O'Malley: Referring to the Alliance Company which is in Dublin now, do you and the Alliance lower your price for gas contemporaneously when you do lower the price?

Witness: We certainly do consult a week or two before; it would not do for one to lower the price and the other not. There is no arrangement be-

tween us; the notices have come out side by side in the paper. We lowered the price on and after the 1st of January, having given notice on the 1st of October preceding.

Mr. O'MALLEY: That was about the time that your notices were prepared; you were ready to advertise your intention of going to Parliament, and you lowered the price?

Witness: I hardly think that that influenced it much; it was discussed at the same time.

By the COMMITTEE: We fixed the price at 4s. 6d.; before that it was 4s 9d.

Mr. O'MALLEY: When was it brought down to 4s. 9d.?

Witness: It was reduced from 5s. 10d. twice, according to agreement.

Mr. O'MALLEY: Can you fix the time when it was 5s. 10d.?

Witness: I cannot tell you that; you will have that better from the local agent.

By the COMMITTEE: It is about five years since it was 5s. 10d.

Cross-examined by Mr. BARRY: There has been a correspondence recently between our company and the corporation of Dublin, relative to an improvement in the illuminating power of the gas; I am not quite sure whether the corporation, in one of their documents, did not ask for 12-candle gas, and we responded that we should give it. I admit that the price was given in as 12-candle gas; we did not refuse to go beyond 12-candle gas, but we tendered a price on 12-candle gas, and that is the price in the correspondence. About the 4th of November last I think we did get a letter to this effect: "To request that the Hibernian Gas Company will say at what rate they will supply a good quality of gas—either 15 or 18 candle gas—for the public lights of the city." Our answer to this was: "The board beg respectfully to refer to the two forms of tender already submitted, from the terms of which they do not think it expedient to deviate" As I have said before, our board is an entirely English board, with a local committee of four or five directors in Dublin. These directors are authorized to take cognizance of complaints, and act upon them as occasion may require; but they cannot increase the illuminating power of the gas nor reduce the price. The complaints which they have the power to remedy are such as a short supply in a district.

Mr. BARRY: The 13th clause in this bill is this, "Whereas the company have expended a sum of not less than £365,000 out of their capital, and a sum of not less than £60,000 out of their profits upon the gas-works at Dublin, Kingstown, and Bray." Do the words there "gas-works," include the abandoned gas-works of the Oil Gas Company that you purchased?

Witness: Yes, they do.

Mr. BARRY: Would any human being reading that understand it so?

Witness. It would be hardly necessary to open a retort-house on both sides of the river, if one was sufficient. I have stated that the total amount of our losses in Cork was from £17,000 to £18,000. That is not included in £365,000 which was expended upon the gas-works in Dublin, Kingstown, and Bray. The Cork accounts are kept distinct from this Dublin bill, and the accounts of Plymouth also. In our bill we propose to give 12-candle gas, and 14-candle gas was put in by Lord Redesdale, I think. The local directors of our company are Mr. Houghton and Mr. Thornhill. Our contract with the Paving Commissioners was "for the best and purest gas." We have supplied the best and purest gas that could be made from coal for 20 years. I do not know that we supplied 17-candle gas in 1847; I have read it in print. I should say that the witness who stated that, had no means of ascertaining.

Mr. BARRY: What do you mean by the letters "D" and "H"?

Witness: The Dublin Company; the old Dublin Company.

A LORD: You say "purchase of D and H Gas Company, £79,450"?

Witness: Yes.

Mr. O'MALLEY: What does "D" mean?

Witness: The old Dublin Company on the north side.

Mr O'MALLEY: Were the Dublin and Hibernian Gas Companies united?

Witness: No, they were distinct companies, under distinct management.

Mr. O'MALLEY: You purchased two of them?

Witness: Yes, as you have stated.

Mr. O'MALLEY: And you paid for one £79,000?

Witness: Yes, that was the old company, and then the Hibernian next.

Mr. O'MALLEY: Why do you put it £79,000 in one place and £76,000 in another?

Witness: There is a deduction of £2030 and odd from the £79,000, reducing it to £76,000 and odd; that was for little workings.

Mr. O'MALLEY: Was the purchase from the gas companies £142,000?

Witness: Yes; £75,000 is only for the extension of mains and alterations, taking in and laying in, in all.

By the COMMITTEE: It is not one item; it is made up of many items. I have not got the account of the many items here, but the books are outside which will verify my statements.

A LORD: Which did you invest—£360,000 or £368,000?

Witness: It is £360,000 for the bill, and £8000 is clerically taken out.

A LORD: What is the use of this account, as an account of your outlay, unless it includes everything?

Witness: It includes £60,000; and of the £60,000 I have the details; £60,000 was outlayed from profits upon a retort-house and works. Since 1847, £10,407. Tanks and gasholders, £26,000; mains in the district, £17,000; engines, exhausters, &c., £2977; Kingstown retort-house, £3309; making altogether a total of £60,000.

A LORD: Is not a great deal of it in the nature of replacing worn-out plant?

Witness: None of it; it is in addition.

Mr. STEPHENS here rose to address the committee with respect to the right of the Commercial Gas Company to be heard against this petition. He said that from the evidence which had been given, it would be gathered that the Commercial Company were supplying gas in the district to which the United General Gas Company wanted to extend their mains. He did not complain of the manner in which his learned friend had brought in the Commercial Gas Company, but he would remind their lordships that his friend Mr. Burke could hardly have said a harder thing against his own clients than that the Commercial Gas Company and all the other petitioners were one in feeling. In fact, there was a strong feeling of dissatisfaction against the United General Gas Company; complaints had been incessant, and public meetings had been held, and applications had been made for better lights, which applications had been met with refusals. Considerably more than eighteen months ago the Commercial Gas Company was formed; and when the proper time came, he hoped he should be able to show their lordships that it was a company which comprised some of the highest and best names in Dublin and Kingstown. His learned friend did not attempt to criticize the names which had been attached to the petition. The Commercial Gas Company was duly incorporated, the date of the incorporation being February, 1864. At that time obviously it was not in their power to make any application to Parliament; but so far from losing time, the company had commenced works at Kingstown with the sanction of the local proprietors; and he should be able to prove that a bill, granted upon favourable terms, was in possession of the company. The Kingstown authorities had such confidence in the company that they had withdrawn the contract from the United Gas Company, and the Commercial Gas Company would shortly enter upon it. But the company did not rest here. They had also acquired works at Dundrum, and were at this moment in full working order. In the petition which had been presented, large numbers of persons had expressed their satisfaction at the manner in which the Commercial Gas Company had supplied the gas; and under those circumstances, he contended that the company he represented had a right to be heard.

The CHAIRMAN interrupted, and told Mr. Stevens that the committee were of opinion the Commercial Gas Company had a *locus standi*.

Mr. *Ogg*, cross-examined by Mr. STEVENS.

The first period of my connexion with the company was, as I have said, in the year 1847; I have not been much conversant with its proceedings between 1831 and 1847. The company did light Cork and Plymouth, but I believe they did not light any other places, except the four which I have mentioned. At any rate they are not to be found in the ledger. The four places they lighted were Cork, Limerick, Dublin, and Plymouth. The position of things is this, that in Cork they have quitted the field, and have made way for another company—a consumers company. At Plymouth it has made way for another company which was originally a consumers company. We were at Devonport; we call it Plymouth—Plymouth and Devonport. We retired from there at one and the same time. At the present moment at Limerick we have an opposition. Separate accounts are kept of the different places which we lighted from time to time, in which the expenditure and receipts are distinctly set forth. I know of no instance in which the expenditure made at one place, or the profits made at one place, have been transferred to another station.

A LORD: Are the profits made at one place expended in another?

Witness: Separate accounts are kept; but the working capital, the company's surplus, of course applies to all.

A LORD: But what I want to know is, was, in point of fact, the balance of an account at one station ever applied to another station?

Witness: Never; not to show profit.

A LORD: I do not ask about showing profit.

Witness: It was never applied.

A LORD: Were you under obligation to keep separate accounts?

Witness: We have done so many years in Dublin.

Cross-examination continued: In addition to the capital proposed to be raised by this bill we propose to take borrowing powers to the extent of £50,000. The committee have heard it; it makes a total of £525,000—£425,000 and £50,000 in shares, and £50,000 in bonds.

Mr. STEPHENS: Let me take you back for a moment to your expenditure, £365,000 in Dublin, Kingston, and Bray; £60,000 profit in Dublin, and £5000 in Bray, making a total of £425,000; in addition to that we have since heard that you lost £20,000 at Plymouth, that you sunk £18,000 at Cork, and that there was also another sum of £20,000.

Witness: None of those two losses at those two stations swell that account.

Mr. STEPHENS: None of them go to make up that capital?

Witness: Not that amount of £425,000 you have read.

Mr. STEPHENS: Does clause 13, which seeks power to capitalize this sum, and also to divide these profits, remain in the bill?

Witness: The £60,000 is in the bill.

Mr. STEPHENS: But is clause 13 to remain in the bill?

Witness: As amended and extended to £525,000—I must ask the agent, if you please.

Mr. STEPHENS: It is rather important to understand that.

Witness: It does remain.

Mr. STEPHENS: Clause 13 says that you seek to capitalize £365,000, also £60,000 profit; £50,000 further shares, and £50,000 on mortgage; that is the bill as it stands.

Witness: That is the Dublin bill.

Mr. STEPHENS: In addition to that, I understand that clauses are to be proposed, not in substitution, but to be added in committee; and clause 12 E says, "Until augmented under the power of this Act, the capital of the company shall be £500,000, divided in 10,000 shares of £50 each." Now, whether you added, or whether you substituted, £500,000 would not be consistent with the other calculation. Is it intended that both shall stand in the bill?

Witness: Possibly counsel can answer that better. It is a new clause as read to me. I calculated on a total of £425,000. I am not acquainted with that amended bill.

Mr STEPHENS: I will read to you the clauses, and ask you which you will accept.

(The learned counsel then read clause 13 to clause 15, with respect to raising money by debenture stock, and clause 13 E, the clause proposed to be added in committee.)

Mr. STEPHENS: I ask you to reconcile the two statements?

Witness: The £500,000 will be an issue of 10,000 shares more, at £50; £50,000 will then make a capital of £500,000 from the shareholders.

Mr. STEPHENS: How does that appear? You yourself state the amount is £425,000; £50,000 upon that will not make £500,000. I ask you simply to account for it.

Witness: I hardly know why that clause was put in in that shape. That is a recent clause, within this last week or fortnight.

Mr. STEPHENS: Taking the amount of capital at £500,000, as proposed by the clause I have read, what are the additions you propose to it by this bill? Are they not these: £50,000 new stock, £60,000 profits to be capitalized, and £50,000 to be raised on mortgage?

Witness: Certainly not; I never understood it in that light.

Mr. STEPHENS: But is it not a fact? Excuse me for saying it is not a matter for your comprehension.

Witness: The £500,000 clause is the amended clause I have not known of. I take it to be that there has been a discrepancy between £450,000 United General Company's capital generally, and the £50,000 sought to be obtained, making £500,000 in £10 shares; that is how it has arisen, according to my notion.

A LORD: The clause here, which I must take as part of the bill, says—"Until augmented by the powers of this Act, the capital of the company shall be £500,000, divided into 10,000 shares of 50,000 each." Now am I to understand that the £500,000 includes, or does not include, the £60,000 which has been invested from profits?

Mr. BURKE: I am told not.

A LORD: I am now proceeding on the supposition that the £60,000 is not included in £500,000; I, therefore, wish to ask you this, because it would be necessary in proving the preamble of the bill. Can you give us the heads of where and how that capital of £135,000 which is invested? Is it at

Limerick, or where, because if we are to deal with the bill as a whole we must clearly have that?

Witness: It cannot be invested, because there is £50,000 never called up. We have received but £450,000. Shares to the extent of £50,000 are unissued. I venture to suggest the total of £450,000 is not represented by investments at works, there is always a floating capital.

After one or two further questions, the chairman suggested that this would be a point which, perhaps, had better be more fully discussed when the clauses were considered.

Mr. STEPHENS: Whatever the amount of the capital of the company may ultimately be fixed at, the public will not get the benefit of any reduction in price until the maximum fixed in the bill has been reached.

Witness: I do not know that they will; that depends on other circumstances—improvements and larger supplies. The Alliance, the competitors with ourselves (whose capital is not wholly paid up), have reduced its price to the consumers before the parliamentary maximum has been reached. The date of the reduction was last October. At that time there were rumours that the Commercial Gas Company was in the field. Their prospectuses were out, and I think their Articles of Association had been signed. This preceded the reduction by both the United and Alliance, but I do not know that it led to it. The date of the previous reduction was two years before. I think there was no talk of another company two years ago. A public meeting was held about the year 1858 with respect to starting another company.

By the COMMITTEE: The Plymouth money is not included in the £500,000; that is entirely out of the accounts. The money out of the accounts was set aside in various ways—it did not trench on the capital paid up; £31,000 was received, the difference was £17,000. That £17,000 was set against old profits in the books.

A LORD: Then the Cork and Plymouth together I may take at £36,000 accounted for out of £500,000?

Witness: Out of the £450,000, the Plymouth is £17,000, and the Cork £30,000.

The CHAIRMAN: We ought to know something of what has become of that £50,000?

Witness: Out of the £500,000 we deduct the £50,000 which is to be raised by authority of this bill, and which is not yet raised, and that would make it £450,000. Our shares have been at a discount. The "sundry personal accounts," mean money owing to creditors.

Re-examined by Mr. RICHARDS: All questions of service of gas and so on are attended to in Dublin. The present price of gas in Dublin is 4s. 6d.—the same as in London. With respect to the report put out in the year 1847, the principal occasion of that was to show cause for a bill being obtained by the Alliance Gas Company, under the name of the Dublin Consumers Gas Company. It is since then that we have expended £60,000 in Dublin in the improvement of the works. The mains of the Dublin Gas-Works were taken up and superseded by others, because they were not large enough for our requirements. With respect to the illuminating power, Lord Redesdale on the first occasion passed 12 candles. On the second occasion 14 were voluntarily substituted by the company.

Gilbert Sanders, Esq., examined by Mr. RICHARDS.

I am agent for the United General Gas Company in Dublin. I had the honour of being chairman of the committee connected with the Exhibition in Dublin the other day. I have been acquainted with the supply of gas to the city of Dublin since the year 1828. I was seven years engineer to the Oil Gas Company, and afterwards superintendent to the Hibernian Gas Company. The gas, when I first knew it, was confined exclusively to that portion which was under the jurisdiction of the Paving Corporation. When the present corporation came into power the city was extended, and the company had to extend its mains in order to meet the requirements of the traffic of the city; and subsequently we have been solicited to carry our mains into the districts where we now are. We went to Kingstown in the year 1835; we went on a requisition from the commissioners of Kingstown, and since then I have carried pipes wherever the commissioners have asked me to do so. At the present moment we light every road in Kingstown, every lane, and every alley, and every place, wherever they have asked us to take gas. Our means are amply sufficient for the purposes of supply. We supply Dealkie and Blackrock also from Kingstown; these are new townships. We supplied Kingstown with gas from Dublin until the year 1856, when Kingstown became so much enlarged, and the commissioners extended their district, that it became necessary for us to build works. We could now supply three times the district, if necessary. It is hard to know what is meant by the word "improvement." Sometimes those which are called improvements are the reverse; but we purify by the best means, and the gas supplied is of good illuminating power. Through the Kingstown, and through the other districts, the illuminating power ranges generally at above 13 candles; by this bill we propose 14. Although there has never been any competition in Kingstown, yet we have always given the consumers the advantage of any competition existing in Dublin. The lighting in Kingstown was governed by the Dublin suburb for prices. The last public contract existing with the corporation of Dublin commenced in the year 1845, and existed for 20 years. They had, however, the opportunity of putting an end to that contract at the end of 15 years, if they had liked, but they did not do so; on the contrary, it was, I think, in 1860 or 1858 that the corporation called on us to know if we would renew the contract for the remaining five years. The price at which we lighted under that contract was £3. 1s. 8d. per lamp; as compared with public contracts in London, that was very low. The district which we light in Dublin is very much more extensive than it used to be; on the other hand, there are parts of Dublin in which the lighting has ceased to be as remunerative as formerly. In the Liberty, for instance, there was more gas used formerly than now; some streets in the Liberty have been altogether swept away. Our capital in those streets has been rendered unproductive, except where a few public lamps are still lighted. The public lights in Dublin are very thinly scattered. I have a comparative statement of the measurement of distances between the public lamps in Dublin and in London, and if I am permitted I will read a few extracts. I find that in the best streets in Dublin, such as Dame Street, which is 27 yards wide, there are 30 lamps to the mile; in College Green, 38 yards wide, there are 32 to the mile; in Westmoreland Street, which is very wide, 42 yards, there are 53; in Capel Street, 23 yards wide, 24 to the mile; in Sackville Street, 50 yards wide, there are from 40 to 44. In computing the number of yards in Sackville Street, I have brought in those lamps which are lighted at the expense of the Post-Office there. They are not public lights, though the public have the benefit of them. Then I take London. Victoria Street, which is only 15 yards wide, has 82 to the mile, while Sackville Street, being 50 yards wide, has only 40; Whitehall, 28 yards wide, has 166 to the mile; Parliament Street has 115 to the mile, and is only 13 yards wide; the Strand has 115 to the mile, and is only 15 yards wide; Holborn has 73. If I go into the back streets of Westminster I take Great Smith Street, there are 56 to the mile; Tachbrook Street has 68. I referred to several streets in Dublin, and found only about 30. There is a difference again in this respect: the Dublin lamps are supplied with only 4 feet per hour, and the London lamps with 5. Of course, in Dublin lamps are put up by us, and lighted wherever the corporation ask for them. The hours of consumption are from dusk till dawn throughout the year. The shops in Dublin generally close at six o'clock; in London they close later. That has the effect of making the streets of Dublin darker than the streets of London. If the corporation are willing to give us the order we are prepared to supply them with gas to any extent. In addition to all the public lighting, we have also about four-sevenths of the private lighting. Notwithstanding this early closing which I have spoken about, the consumption of gas in Dublin has of late years increased very much, and this has caused the company a very large expenditure of capital. In Dublin we carry on our manufacture in the best way, I believe, that it can be carried on. Our engineer is Mr. Romans, who came to us straight from a London company. If necessary, I am prepared to give the capacity of our manufacturing power, our stowage power, and our distributing-power. As local resident manager of the works, I believe that, on the whole, we give general satisfaction to our customers; and the best proof of that is the large amount of business which I have collected within the last few years. If you please I will give you the reductions from 1848. In 1848 the price was 5s. 10d.; in 1853 it was 5s.; in 1854 it was 5s. 10d. again; in 1857 it was 5s.; in 1859 it was 4s. 9d.; and it continued at 4s. 9d. till the 1st of January last. It is now 4s. 6d. The first reduction, in my knowledge, was in 1836. The price was then 10s.; it was reduced voluntarily by the company to 8s. Sometimes the reduction has been made under the pressure of opposition. Take, for instance, the year 1847, when the Alliance Gas Company were just starting. The price of gas at that time, I believe, was 7s. 6d.; subsequently it was reduced to 5s. 10d. Since then it has been reduced to 5s. Afterwards I was obliged to raise it, in consequence of the Russian war. With reference to the pressure of the gas (which is one of the complaints in the petition), it is more than sufficient in every part of the city. Our gas is tested every day by the most improved machinery for testing gas.

Cross-examined by Mr. O'MALLEY: I have no employment but for the company's business. I am not cumbered with offices; I hope the citizens of Dublin do not consider me cumbered; they do not treat me as if they did. My office is at Foster Place; that is about three quarters of a mile from the works. I have a photometer apparatus at my own office; there is also one at Lombard Street, near Westland Row, and another at the works. The gas is tested at the works in Lombard Street, and at the house of the district superintendent. It is daily tested at those two places.

(A coloured map was here produced, and Mr. Sanders explained the positions of the different districts, and said, that although, perhaps, the boundary to which the company sought to extend its operations was larger than would be necessary, yet, having taken parishes as their guide, the map showed the parishes which were named in the Act.)

Mr. O'MALLEY: I understand you to say that, though you are seeking for parliamentary powers to light all that, it is not your purpose to light it?

Witness: Part of it is mountain land; we could not light it.

Mr. O'MALLEY: I am not asking you whether it is mountain land, but you do not propose to light all the land which you include within your limits.

Witness: We do not. The extent from the north-west to the south-east limit is about 15 miles, as near as I can measure it. The reason that we take in this district when we cannot light it is this: we were bound to give something definite, and thought we had better take parishes; there was another line proposed, but it was my own wish to take the parishes. We do not propose to go to Finglas, nor to Palmerstown. We propose to go to Dundrum. We propose to take possession of all this district which I have named for the public benefit, not for our own.

Mr. O'MALLEY: How do you consult the public benefit by taking parliamentary power, and a monopoly over a large district which you do not intend to light?

Witness: I will take, for example, Clontarf. I have been frequently solicited by the inhabitants of Clontarf to convey gas to their township. They did themselves intend to apply to Parliament a short time since for a bill, but it was opposed by the residents. I could not supply Clontarf under existing circumstances, and I proposed taking in Clontarf, and I have gone to a certain distance there without parliamentary powers since Christmas, at the earnest solicitations of a large number of persons residing in the township. Our main works are situated at the mouth of the river Liffey. We have a contract with the commissioners of Dealkie, and are preparing to light it now. There are also works at Bray. I advised the company to come to Parliament four years ago, and the reason I did so was because I did not think we had power to continue working the district where we were. It is my general business to see that the citizens are satisfied with the lighting. We have had many complaints that the gas was not good, but I have always rectified them. Mr. Pym, of Great George Street, has frequently complained. He consumes about £500 of gas a year in all his establishments. He may have complained twice a week, but he has always been well attended to, and I do not think that he will say to the contrary. I do not know a man of the name of Roberts, a wholesale druggist, of the firm of Hunt and Co. I do not remember that he has complained, but I could not charge my memory with the whole of the consumers in the company's books—some 8000 or 9000. We have a complaint-book; it is in the lobby. The clerks in the office enter the complaints. I will not undertake to say that all the complaints are entered in that book, but I do solemnly believe, as I stand here, that not one out of every 100 is omitted. I get some 3000 or 4000 entries in the complaint-book in the course of the year; but the books contain many things which are not complaints against the gas company. Sometimes we find that in case of a complaint the parties themselves are answerable, and not ourselves. Since 1847 our works have very nearly doubled in capacity; we have taken in additional land, we have built three gasholders with a capacity of a million and a half, we have erected a new retort-house, we have changed our system from iron retorts to clay, according to the modern system, we have put up new steam-engines, exhausters, condensers and purifiers. As I said before, our business has increased very much. Business increasing over a given area adds to the profits very much, and that is how we have been able to reduce the price of gas. I suppose we have been dividing on an average not more than 4 per cent. I cannot tell the reason we are at a discount; that remains with the public.

Mr. O'MALLEY: Do you mean to say you have been dividing 4 per cent. on a capital of £450,000?

Witness: We have been dividing from 3 to 4 per cent.

Mr. O'MALLEY: You said about 4 per cent.?

Witness: I am going further back now. We divided nothing in 1847 and part of 1848.

Mr. O'MALLEY: I do not ask you to go so far back as that.

Witness: I will go back to that, because we began with about 2 per cent.

Mr. O'Malley: Time and the increase of consumption have enabled you to make these dividends. Have you been dividing 4 per cent. on this £450,000?

Witness: Since when?

Mr. O'Malley: You put your limit at 4 per cent.; what do you mean?

Witness: I cannot say; the average for a good many years past has been 4 per cent.

Mr. O'Malley: On a capital of £450,000?

Witness: Yes. In 1853, when we made a reduction, the freights on coal, which had previously been about 9s. per ton, amounted to nearly 18s. We do not use much cannel coal; we use Boghead coal. I cannot tell you how much per cent., because the two coals are mixed. The present price of cannel coal is 22s. 6d. There is a stuff called cannel coal brought into the Dublin market that I could not use; I have lately had it offered to me at 14s. When I was engineer we used about 2 per cent of cannel coal.

Mr. O'Malley: What were you using in 1847, when the 17-candle gas was given?

Witness: There was never 17-candle gas.

Mr. O'Malley: Then that was a myth?

Witness: A myth. The mode of testing gas at that time was ridiculous; it has no comparison with the mode of testing gas now. Our own engineer may have sworn it, but 17-candle gas was a myth at that time.

Cross-examined by Mr. Barry: The Hibernian Company were then making the best gas. I am right in stating that at the time we raised the price of gas, we were paying 17s. for coals. In 1854 the gas was raised to 5s. 10d., and then coals were dearer.

Mr. Barry: Now with respect to the dividends. I hold a return in my hands that from 1850 to 1862 you never but twice reached 3 per cent., and that you were down to 2 per cent. and 2½ per cent.; and then in 1863 alone you paid 4½ per cent. Look at your own returns.

Witness: I do not know that return. You must understand me that the accounts for the dividends pass through my hands, and I can only tell you as near as I can recollect what the dividends were we have paid. Now I come to consider, four half years, I think, were 4 per cent.

Mr. Barry: You are either speaking of what you know, or of what you do not know. If you tell me you know nothing whatever of the dividend, and that you knew nothing about it when you said 4 per cent., I will not ask you another question. Do you or do you not know what the dividends were for several years past, on an average?

Witness: I cannot charge myself with it.

Mr. Barry: Then we may take as expunged from the notes what you said about the 4 per cent.

Witness replied that when he stated 4 per cent., he was speaking from memory.

TUESDAY, MAY 23.

Mr. *Gilbert Sanders* recalled, and further cross-examined by Mr. Barry.

I have had no opportunity of making an inquiry since yesterday as to what was the average of our dividends; but from recollection and going back in my memory, I may state that I wish to correct that part of my evidence, because the dividends as they were usually struck were not a per centage, but so much per share. In hastily answering the question yesterday, I had not time to calculate up; but I have since then recollected that the dividends did range from 2½ to 4 per cent. The fact is that we paid 12s. 6d. for £50 shares, and, upon the half year, 15s., 16s., and £1, with 3s. or sometimes 5s. bonus. It may be that 1864 was the only year in which 4 per cent. was paid. I yesterday took certain streets, and gave you the number of lamps. I should think there are about 50 lamps in London for 30 in Dublin. They are paid also for burning one-fifth more gas in London than in Dublin. I consider Dublin insufficiently lighted. I think that you should increase the number of lamps. I do not think you require so many lamps in Dublin as in London, as there is less traffic; but you ought to have a larger number of lamps than at present.

Mr. Barry: And increase the burning power?

Witness: No. I think that you have got good gas in Dublin. An increase in the power of the gas would not be so good a way of effecting the object as multiplying the number of lamps. Of course there is no objection to the city getting better gas, if they pay for it. I know nothing about the capital, nor how long it is since the £450,000 was all paid up. I do not believe that any shares were issued since I was first connected with the company. The price charged at Kingstown has always been the same as that charged at Dublin, and we have charged nothing additional to Kingstown for extending the works there. The power of the gas hitherto supplied in Dublin is from 12 to 13 candles, tested according to parliamentary usage. Sometimes it was with Sugg's burner and sometimes the Birmingham burner; latterly it has been the Birmingham burner. Sugg's burner gives a better illuminating power than the old Argand burner, but not better than the Birmingham burner, which was established last session.

Mr. Barry: Is it not the fact that now, by using Sugg's burner, gas that would have been 12 in 1860, will be 14-candle gas now?

Witness: It would depend so much really upon the kind of burner that you used in 1860. I have seen the same results in that year from the Argand burner that you refer to in Sugg's. Mr. Wright was an officer of the corporation and of our company for testing gas for Dublin for many years.

Mr. Barry: Can you say whether he was using anything representing Sugg's burner so far back as 1860?

Witness: He was; I am sure of that. Mr. Wright and I often compared notes.

A Lord: Is Sugg's burner more expensive than the other burner?

Witness: No.

A Lord: Why is it not generally used?

Mr. Barry: The companies use it for testing, my lord. Sugg's burner is a kind of Argand burner, and that is never used for street-lamps or ordinary consumption. It requires a glass shade, and is a very complicated thing.

Cross-examined by Mr. Stephens: The quantity of gas annually made in Dublin by our gas-works is 400 millions. I cannot give you the total made by the two companies. The quantity of gas made at the present time by our company and the Dublin Company is larger than at any previous period. The price of gas is to some extent dependent upon the quantity of gas sold. Our company has on two occasions contracted for the lighting of the city of Dublin. The first was in 1825 or 1826.

Mr. Stephens: I am talking now of 1839; 1826 was before the date of your charter?

Witness: No; it was after the charter.

Mr. Stephens: I thought the date of the charter was 1830?

Witness: I did not know that.

Mr. Stephens: I am speaking of the United Gas Company?

Witness: I do not know the date of the charter, but I know that the United General Gas Company supplied gas to Dublin in the year 1825 or 1826. I am not prepared to say that from my own knowledge, for I was not in Dublin at the time; but I am speaking from documents in my hands. In 1839 there was a renewal of the contract of 1825; and in the contract of 1825 it was specified that at the end of 14 years the Paving Corporation should have a right to compel the gas companies—that is, the Dublin and Hibernian Gas Companies—to renew the contract for seven years additional, and that is the renewal of the old contract; and I think the price was then £3. 1s. 8d. per lamp. I was not at that time in Dublin, and do not know the price charged to private consumers; but I believe the universal price in the kingdom was from about 12s. to 15s. per 1000 cubic feet. In 1845 there was another contract entered into, which has terminated. The price at which the company then contracted for the public lighting was £3. 1s. 8d. It was not £3. 4s. 3d. I know the history of that contract. We were forced into it by the Government.

Mr. Stephens: How do you mean that you were forced to take it by the Government?

Witness: The Government would have supported the Paving Commissioners in forming a municipal gas company, like that which was established at Manchester, if we had not yielded. At the time the company contracted on this occasion for the public lights at £3. 1s. 8d., the price charged to the private consumers was, I think, 7s. 6d. The rate which the company now seeks from the corporation per lamp is £3. 12s. 6d. on a three years contract —from one to three years, and £3. 7s. 6d. on a ten years contract. That includes everything; outfit and everything. If the corporation choose to pay for their gas by measure, then they must also pay for the expense of lighting, but if they choose to take it by contract, that includes all the expenses, with all the outfit, putting down the mains, and erecting lamp-posts, and everything complete. The price now charged to private consumers is 4s. 6d. The quantity of coals annually imported into the works is about 40,000 tons; of course the quantity varies with the demand for gas. The coal we chiefly import is the Newcastle coal; we import the cannel coal sometimes. We never use any other kind of coal besides the Newcastle and the cannel, when we can get the Newcastle coal, but we are obliged to use other coal. We import both Boghead and cannel. I cannot give you the proportion of cannel coal imported as compared with the general coal, but that information will be supplied to the committee. The proportion of Boghead or cannel, if used largely in the works, influences the quality of the gas supplied. The dividends have kept pace with the steadily increasing sale of gas by the company. I think there was a fluctuation about three years ago, but on the question of dividends I am not very clear. I believe there was a depression about that time, but I am not certain. With respect to the works at Bray, we purchased them last year. The amount paid for them was £4000. I cannot tell you out of what funds the company paid for these works. The directors alone found the money. Till recently our company lighted Cork, and I think the charge was 6s. It might have been 6s. or 7s.; it varied the same as in Dublin. I cannot say whether any applications were made to the company to reduce that rate. I had nothing to do with Cork except as consulting engineer; all the business was transacted through the agent and the directors, not through me. I have heard that the price of gas in Cork at the present time is 4s. We have ceased to light Cork. A new company has bought our company there; with two sets of works it lights Cork for 4s.; we charged, as I said, 6s. or 7s. With respect to the amount of leakage at Dublin, the directors have complained of that as being large. It has been as much as 20 per cent. It has not been necessary within the last few years to cut out any portion of the works as being so bad that they could not be continued, nothing of the kind. Some of the pipes were too small, and we cut out a good many small ones, and put down large ones; that has been done to a considerable extent.

Mr. Stephens: Is it a fact that of the former works of the company, by which, until recently, Dublin was supplied, of those pipes there are now 10,000 yards lying dead in the street?

Witness: There are some pipes lying dead, but I must refer that question to the engineer. When you say lying dead, I will just explain that. When an old pipe lies in the street—a small one—it will not pay for the expense of taking it up; and when a large pipe is laid down instead, it is left there; for instance, in the case of a 2-inch main, if we were putting down a 6-inch main instead of a 2-inch, the 2-inch is not worth the expense of lifting. We pay 2s. a yard to the corporation for opening the street, and it does not pay us. With respect to the question whether coals will hereafter be supplied to Dublin cheaper than they have been heretofore, that is rather difficult to answer in the face of an actual rise at the present time. We had notice the other day that a rise is taking place in the price of coals at the pit's mouth. I am endeavouring to organize screw-colliers for Dublin, which, of course, will be as much for the public benefit as for the gas company's benefit. The advantage to the company would be to make them less dependent upon the summer supply of coal than they are now, so that instead of storing up large quantities at the commencement of winter, we should be able to bring the coal in more gradually. This would have the effect of diminishing the amount of capital invested in storing the coal. I cannot give you what amount has actually been expended upon the improvement of the works in any one year, taking the last few years. I was, a few days since, looking over a return furnished to me by our engineer, in which he showed me that we had expended about £30,000 in four years, in laying down mains in the out-districts and in Dublin. I could not say that the outlay has been £5000 a year or not, but I could say, from my own knowledge, that there must have been considerably over £60,000 spent in the improvements and the extensions of our establishment within my memory. I cannot undertake to say whether that money has been spent out of capital, out of profit, or out of current receipts. To a certain extent I have a supervision over the control of the expenditure in Dublin. Generally, before expenditure takes place, I communicate with the directors, but in case of need I act at once. We use wet lime for purifying. I have heard that some of the London companies use oxide of iron, but I deny that the oxide of iron is better than wet lime. If left to myself, I would not alter the purification. In our bill we take power to manufacture residual products; it is a power which, to some extent, has hitherto been exercised by the company. Our works in Dublin are near the Kingstown Railway, which is the point at which the greater part of the traffic from England arrives. With respect to taking power to extend these works, if we think proper, to the extent of 10 acres, I do not think that there are 10 acres altogether in the Dublin district. I think we are prohibited from carrying on any manufacturing process, except upon the ground now occupied by the company; at Dublin, I know we cannot get land, because there is none obtainable. As far as the bill goes, certainly there is nothing to hinder us from crossing Great Brunswick Street, and getting 10 acres on the other side. I stated that the company extended its operations to Dealkie. I think there were applications made to the company some years ago to carry gas to Dealkie, and they carried gas up as far as the houses where they were thickly into the town. That was before there were Town Commissioners. I am not aware that an application has been made to the company to extend its operations to Dealkie, and that they refused to do so. I know

that the Commercial Company, if you call it a company, was projected near Dalkey; it has no means of doing the work. The extension to Dalkey was immediately on the formation of the Town Commissioners. When these became a responsible party, who would be accountable to the company for the the gas, the company then laid their mains into Dalkey. The Town Commissioners were formed about two years ago.

Mr. STEPHENS: Has not the Commercial Company been about two years in existence?

Witness: This would have been whether they had been in existence or not.

Mr. STEPHENS: Were not the two things quite contemporaneous?

Witness: I think it is likely. The Commercial Company was started, seeing that we were going into Dalkey, quite as much as that we went there on account of their being established.

Re-examined by Mr. RICHARDS: I have said that the leakage has been as high as 20 per cent. What is meant in gas language by leakage is the difference between the gas made and the gas paid for. It includes all the gas burnt upon our works, that is wastеage, and all the gas that is lost by condensation, or rather all the gas that we do not get paid for. We have it under the head of wasteage account 22 and 24 per cent. Wasteage and leakage cannot mean the same thing, because there is leakage independently of wastage; for instance, the leakage that takes place in the pipes cannot be the same as the gas that is consumed on our own works. At the time we were charging £3. 1s. 8d. for public lamps it was a very losing contract; the city of Dublin has had the advantage of that for 40 years. In proposing to charge £3. 12s. 6d., or £3. 7s. 6d., for a longer contract, we should still charge a price per 1000 feet below that at which we propose to sell gas to the private consumer. I think the corporation of Dublin ought to pay nearly the same price as the largest consumer. I believe that in the Metropolis Gas Act of 1860 it is expressly provided that the public lights shall be charged at a price not greater than the lowest price charged to the private consumer.

Mr. RICHARDS: You have been accused of buying up old companies at reckless prices; have you done that, or have you given fair and reasonable prices?

Witness: I think that the Dublin company expended about £126,000 before they would exchange with one company in 1824 or 1825.

Mr. RICHARDS: What did you give them?

Witness: I heard our secretary say yesterday it was about £75,000. We originally utilized the mains which we bought of them, and we have some in use now. We used them until the pipes were found too small for the extension of the lights. With respect to the complaints of Mr. Pym, which were with respect to a want of supply and a dimness of light, we have always sent persons to rectify what was wrong, but Mr. Pym's premises were originally fitted up improperly. I remember calling upon him myself some time after the place was fitted up, and I said then he never could expect to have a good light on account of the fittings. I know that on one occasion that I saw Mr. Thomas Pym, and I asked him to walk into the street with me; he had complained of the gas in his house, and I asked him to look at the next shop which was lighted out of the same pipes that his house was. The next house was exceedingly well lighted, but Mr. Pym's was not, which evidently showed that the defect was not in the mains, or in the supply, or in the quality of the gas, but in the fittings and the burners which they had in the house. When complaints are brought to us, we do our best to set them right; we are very particular to leave no cause for discontent on that score.

Mr. RICHARDS: You stated you had a complaint-book, in which you find from 3000 to 4000 entries per annum?

Witness: It is hardly to be called a complaint-book; it is a book for the general entry of reports from consumers, and they amount to 3000 or 4000 entries in a year. I do not call them complaints, they are reports. I have an analysis of them here. I will take the year 1862. There were 1752 reports arising from defective fittings, and some of those we repaired. In 1863 we had 2025 reports from the same cause. In 1864 we had 1681. We had 484 reports arising from defective burners in 1862, 490 in 1863, and 426 in 1864; that is, persons complained that the service was not good. If we found that they were not using good burners, we gave them new ones at our own cost. There were 43 escapes in one year, 45 in the next, and 84 in the next; those we repaired without making any charge. Of taps that were defective there were 277 in 1862, 218 in 1863, and 129 in 1864. In 1862 the Sale of Gas Act came into operation, and gave us some trouble with our meters; we were compelled to use certain meters, and it was very difficult to comply with the Act. In 1862 we had 988 complaints, arising from the meters; we had 777 in the next year, and in 1864 we had 54. We are gradually replacing those meters by substituting better meters of better construction. We do not make a charge for these things, and the establishment necessary to carry them out will cost the company £800 a year, I should think. With respect to the district which we propose to take, we purpose lighting such places within that district as offer us a reasonable hope of remuneration.

By the COMMITTEE: There are two companies in Dublin within the municipal boundary—the Alliance Company and this. The Hibernian Company supplies more gas than the Alliance. We supply all the public lighting, and about four-sevenths of the private lighting. At the present time the public lighting is rather more than a seventh of all the gas sold by our company. I do not know what the other company sells. There is no agreement between ourselves and the Alliance Company with respect to price. The sale of the products, other than the gas and coke, does not nearly balance the price of coal in Dublin; it is a long way from that; I think that it is very little more than half. I think the Alliance Company pays about 8 per cent. dividend.

In answer to Mr. O'HARA, *Witness* said that he received a notice late on Saturday night to produce certain documents, and early on Monday he received a telegram to attend in London. He did the best he could to bring all the books and papers he could on so short a notice.

Mr. *Daniel William Ogg* recalled, and further examined by Mr. RICHARDS.

I produce the balance-sheet of the company read at the last annual meeting.

A LORD: I wish to call your attention to certain figures I obtained from you yesterday. You informed us that £365,000 had been laid out in Dublin.

Witness: Yes.

A LORD: And that in addition to that a further sum of £60,000 had been laid out in Dublin, making altogether £425,000?

Witness: £60,000 out of the profits, not out of the capital.

A LORD: Then the figures which you gave of £450,000 do not include the £60,000 taken out of the profits?

Witness: No.

Mr. RICHARDS stated to the committee that the clause numbered 12 E had been prepared without the cognizance of the witness, and that the sum of £500,000 had been inserted by mistake for £450,000.

A LORD: Let us get at what the capital of the company is. First of all, we have £365,000 invested in Dublin?

Witness: Exactly. The £60,000 expended out of profits forms no portion of the capital of the company at all in the capital account. And of course this £50,000 which this bill is to give power to raise does not enter into the capital spoken of in this clause.

A LORD: Then we come to Cork and Limerick, where the capital invested in one way or the other is £35,000?

Witness: It should be amended to £56,000. Will you allow me to go on from the 450,000? For Dublin the sum is £360,689. 8s. 8d.; for Cork, the amount was £56,000, less the purchase, £27,483, which leaves a loss of £28,517. The balance was paid out of profits. Then we have an investment at Limerick of £17,762; and at Bray, £4251. These sums are not included in the £360,000. In round numbers, these items amount to £411,220; and then there is an additional sum of outlay of £2000 and odd, making the capital £413,322. 7s. 7d. That leaves a floating balance of capital of £37,000, which yesterday was not accounted for. We cannot work such a company as this without at least £30,000 or £40,000 of working capital. With the long credits which are taken at some of the stations, we had to borrow, last December, £6000, and to give bills for £8000. This is borne out by this balance-sheet.

A LORD: Are the retorts which you have in hand not included in the sum of £360,000?

Witness: Certainly not. Stocks in the works are not included in the £360,000.

A LORD: What do they amount to?

Witness: To about £37,000. You will observe the item of £40,000 and more for the Dublin station alone. When the gas quarter becomes due, the account is turned possibly by £24,000. Part of the floating capital is invested in stocks of various kinds, which are necessary for such works.

A LORD: The clause 13 of the bill provides for separating the accounts. Part of that stock ought to belong to Dublin; can you say how much that is?

Witness: Considerably more than £30,000, in consequence of our borrowing on the other side, as is shown by the balance-sheet. Beyond the £450,000, we have certain capitals as receipts to carry in.

A LORD: The £58,000 is made up of coals, meters, balance at bankers, and items which are not included in the £360,000?

Witness: Yes. The amount which ought to be charged to the Dublin account happens to be as much as £58,000. It includes a large amount of mains which have not yet been brought in, to the extent of £10,000.

By a LORD: Then the £50,000 we may call the floating capital belonging to the Dublin account?

Witness: Yes.

A LORD: In addition to the £37,000?

Witness: In addition to the £37,000. That proves that we want more capital. When the dividend is due it is impossible to pay it without a loan, or without getting in money from the gas consumers.

A LORD: The amount put down to Bray must, I suppose, come into the Dublin account.

Witness: Yes. But you will allow me to say that the £58,000 is partly made up of loans on the other side. The total of that account is not £450,000, but £497,000.

A LORD: The £13,891 put down to Cork is part of the price paid you?

Witness: Yes; paid by annual instalments of £2700.

A LORD: Can you give me the floating capital, including not only what is invested in stocks, but investments of any kind which come upon the capital of Dublin account; am I to enter £58,000, or a larger or smaller sum?

Witness: The balance-sheet, as approved, shows £58,000; that includes everything, book debts, and outlay in the stocks.

A LORD: I do not understand your putting down mains as assets in hand.

Witness: It is in order to account for the outlay of the money; it has not yet been placed to the £360,000. The board had some reason for that; but perhaps in six months it will be included in the £360,000.

A LORD: I observe the amount is nearly £11,000.

Witness: Yes. One main feature is £24,000 of book debts. They are good debts, yet it takes a long time to get them in.

A LORD: Then you enter an account for retorts and meters?

Witness: We have adopted a system of some of the larger companies, which is to take value for a clay retort for three years.

A LORD: Then there is due by sundry persons, £130. Why is that not included in Hibernian Gas Company's stock and products?

Witness. It is a small advance, principally to pay dividends. Then there are bills receivable, those are good assets.

A LORD: What is this item of £2780?

Witness: The company have received it, and therefore it is a liability the same as capital. The interest is received every half year at the rate of £412. The instalments are paid regularly every year about the 5th of July. The working operation shows that the whole capital of the company is £493,000.

A LORD: If these two accounts were kept separate—the capital account at Dublin added to the general capital account, Bray being included in Dublin—there would be shown a total of over £500,000?

Witness: Exactly; the £100,000 you take as bonded debts, and on shares issued. I keep the Dublin accounts in three sums.

A LORD: I want to get at the two separate accounts. We were asked to go into these accounts, and yet one is always thrown into the other. It will complicate matters, when we come to ascertain whether Dublin is likely to be worse off.

Witness: The £60,000 outlay has no connexion with that balance; it is now sought to be capitalized in our bill, but it is not in that paper.

A LORD: A part of the floating capital is going to be capitalized in the Dublin account?

Witness: No, not of the floating capital; we want £50,000 more of capital.

A LORD: Into what account do you enter the floating capital?

Witness: It is the result of working; we do not enter it. By the working operations we are compelled to be in advance £35,000, £40,000, or £50,000.

A LORD: How will this bill enable you to raise the £50,000?

Witness: I believe we shall raise it by bonds first; at present we cannot do so, as we have no power in the charter. Possibly the moment we get this bill we shall raise this £50,000 on debentures.

A LORD: And let your £50,000 worth of shares remain in abeyance?

Witness: Possibly, until they touch par.

A LORD: Will clause 12 in the amended bill bind the company in any way whatever?

Witness: It should be £450,000.

A LORD: Then the floating capital does not form a part of the capital there mentioned at all?

Witness: It will form a part of it; if we receive £50,000, it must form part of it; it forms part of the £450,000.

A LORD: I am speaking of the £58,000 floating capital. Clause E refers to the capital of the company before the passing of the Act, because it says, "Until augmented under the powers of this Act, the capital of the company shall be £500,000;" if that binds the company in any way, I want to know whether the £500,000 includes the floating capital?

Witness: I submit that it is not £500,000, but £450,000.

A LORD: Then the £450,000 does not include the floating capital?

Witness: It includes the £37,000.

A LORD: Not properly; because you say, "reorganization of mains, £11,000?"

Witness: The statement here embodies £413,000 outlay. There is £13,000 on the other side. It was decided by the proprietors, twelve months ago, that it should be set against the Cork bonds.

A LORD: That does not explain this item--"£11,500 of money laid out from the capital account." In the £450,000 you include £411,000 plus £11,500?

Witness: Yes.

A LORD: Out of the £37,000, the greater portion really belongs to the Dublin account?

Witness: The greater portion must, if you compare the large station with such a small station as Limerick.

A LORD: You are aware of the present assets of the company, not including the goodwill; but the land, and the buildings on the land, and the factories, which have been brought into capital account, what is the value of that?

Witness: That is a difficult question; I will give you my version of it.

By a LORD: For what sum would another company coming to Dublin to commence proceedings *de novo* be willing to purchase the land and put up the buildings that are there, and lay down the mains, &c.?

Witness: Including the mains and works, just over £300,000, I should think. There are other witnesses who can give better information upon that. I am considering what may have been sacrificed for the oil gas.

Mr. O'HARA said his clients were prepared with evidence to show what would be paid by a new company.

A LORD: We have had the floating capital spoken of as two sums—£37,000 and £58,000. What is the difference?

Witness: The difference is bills receivable, and a loan of £6000 or £8000.

A LORD: Then we may look upon that difference as money in hand?

Witness: Money in hand perhaps ultimately.

A LORD: It is not stock invested?

Witness: No.

A LORD: You tell us that the £6000 loan and bills payable go against the £13,891 to the Cork Company?

Witness: Other items go against the sheet on both sides. I have been accustomed to take the capital received, and the investment and the stock, and that difference is £37,000 in mere figures.

A LORD: I suppose your capital account varies from day to day—after quarter-day, and so on?

Witness: We must have a large stock of coals always on hand. It is impossible to get coals in Dublin under three months.

A LORD: None of the £58,000 enters into the capital account as yet?

Witness: None of it would enter into the capital account except the £10,000 for mains. That would be charged against investment ultimately, and the rest will be received and brought to credit.

Cross-examined by Mr. O'HARA: I knew from the commencement that I should be examined as a witness! I made certain preparations with regard to capital and the statements generally.

Mr. O'HARA: How was it that yesterday you were not able to give us the particulars which you favour us with to-day?

Witness: I may perhaps say that I scarcely comprehended the £500,000 question at issue.

Mr. O'HARA: When did you comprehend the question at issue?

Witness: The moment that it was divested of the £500,000 matter, as amended by Lord Redesdale in clause E 23. I was enlightened by the discussion which took place here yesterday. The statement I have prepared I prepared by myself, with no assistant whatever. I did not show it to an accountant. None of that floating capital of £37,000 has been allocated to Cork; we have long ceased to light the town. The amount at Limerick is £2000 or £3000, and the £365,000 forms the capital of Dublin and Bray, or rather attempts to form it. But it is inadequate. Practically speaking, we certainly do not want to add to the £360,000 the £58,000 and the £35,000; the £58,000 contains the £37,000. The £58,000 is made up of book debts, £25,000, stock remaining, coals, and everything else, fixed retorts, and £10,000 for mains. The extent of our investment, according to our balance-sheet, is £413,322.

Mr. O'HARA: And you add the £58,000 to that?

Witness: In the balance-sheet the £58,000 is beyond that; that would be £469,000.

Mr. O'HARA: Then you must add the £35,000 in addition.

Witness: Not in addition. The £37,000 is comprised in the £58,000.

Mr. O'HARA: I first of all get the general investment, £413,000 odd, then I get retorts, meters, reorganization, &c., £58,376. What is the remainder of the account composed of?

Witness: Of the Limerick station, the Bray station, coals in transit, money in bank (which is not a very large sum), and bill of the corporation receivable. We propose by this bill to raise a further sum of £50,000, in addition to £360,000 and £60,000. Then there was that £50,000, the amount of the last call, and debenture bonds of £50,000, which, with £25,000 for Limerick would make a sum total of £550,000.

Cross-examined by Mr. STEPHENS: The actual expenditure in Dublin and Kingstown has been £360,689, and in Cork alone £28,517. At Plymouth there has been a loss of £14,331, which we do not bring into the accounts; it was long ago discharged.

Mr. STEPHENS: In what position does that account stand?

Witness: That was explained by our chairmain in 1849, in this way:—"The difference or loss sustained upon the amount at Plymouth and Devonport we have written off to the debit of the sinking-fund account, thus placing the general investment account in a safe and sound position, without encroaching upon the paid-up capital of the company."

Mr. STEPHENS: Did you say that when the loss was £14,331 it was discharged out of profits?

Witness: Out of a fund appearing in the books. It could not have been capital.

Mr. STEPHENS: Then if it is not capital, it is profits?

Witness: It might have been profits; it was at the time. It is discharged in order to redeem that station.

Mr. STEPHENS: It was not discharged from profits made at the Plymouth station?

Witness: Possibly not, and possibly it might have been partly. At one time Plymouth was in a very flourishing condition. We closed the station in consequence of the very general feeling of the inhabitants against the then agent. We do not propose to close the establishment in Dublin because of the feeling of the inhabitants as represented before this committee; quite the reverse, I should say.

(Mr. STEPHENS here read to witness the evidence he had given on the previous day, in which he had stated that separate accounts were kept of all the places which the company lighted from time to time, and that he had never known an instance in which the profits made at one place had been transferred to another.)

Mr. STEPHENS inquired whether, after having had his attention attracted to Plymouth, he was aware of a case in which the profits or capital of one station had been expended upon a different station.

Witness replied that he knew of none; he assumed there might have been losses at one station which had come out of two or three.

Mr. STEPHENS: Did you give me that qualification yesterday?

Witness: I think that you hardly put the question to me in that form.

A LORD inquired whether clause 13, by securing a separate account, ensured that the profit of Dublin would not go to pay off debts entered in the general account.

Witness: Most assuredly by this Act, because we must work according to the fixed capital in the Act.

Mr. STEPHENS: You stated that the amount expended in Dublin is £360,000. Will you add together £28,500 lost in Cork, £17,000 lost in Limerick, £4251 at Bray, and £6000 borrowed. That will come to £56,500?

Witness: Yes.

Mr. STEPHENS: Is not that as nearly as possible the £60,000 which you seek to make additional capital of?

Witness: It happens to be so by a coincidence.

Mr. STEPHENS: Looking at that £60,000 in the way in which I do, would it not be making the people of Dublin pay for the loss at Cork, the expenses at Limerick and at Bray, and the £6000 liabilities of the company?

Witness: No; I think that if the £60,000 has been justly laid out in Dublin, by which means they have had double the quantity of gas within the last 15 years, they cannot complain. We left Cork in consequence of there being a strong disposition on the part of several persons to have their own gas.

Mr. STEPHENS: And an indisposition to have that of the United General Gas Company?

Witness: That was the case with one-half of the customers, but with the other half there was a strong disposition to remain with us on certain grounds. The board decided that it would not be judicious to remain there.

Cross-examined by Mr. NORWOOD: I yesterday stated that the loss at Cork was about £18,000, that was a mistake. I now say that it is £28,000; there was a sum of £10,000 for interest. I should certainly be surprised to learn that it was £38,000; the books do not show that amount. The works in Cork were sold in 1858; they were sold for £27,400. The expenditure on the Cork works up to the date of sale, as fixed by the Legislature, was £56,000. We were compelled to enter that as outlay. We obtained an Act of Parliament, and within the next year or two we sold. We sold gas in Cork at 2s. 6d. for seven or eight months.

Re-examined by Mr. RICHARDS: At the time we were selling gas at 2s. 6d. there was an active competition going on—a ruinous competition. There is only one company in Cork now. The balance-sheet which I produced was distributed amongst the shareholders in March last.

Mr. RICHARDS: You have been twitted with getting into confusion as to the accounts. Do you say that that arises from the questions being based upon the £500,000 in clause E?

Witness: Completely so.

Mr. RICHARDS: Had you seen that clause, or had you anything to do with it?

Witness: I did not understand it, although I looked at it just before I came into the committee-room. Previous to our leaving Plymouth, we were selling gas at the competition price of 4s. The competing companies were selling, one at 6s., and the other at 5s., and they contemplated a total reduction to 5s., if not lower. I cannot estimate the loss by that competition, which continued about two years to my knowledge; whatever it was it would be carried to the debit of the general profit and loss. I can ascertain what it is, and tell you in the course of the afternoon, and also the loss at Cork.

Mr. *Gregory*, examined by Mr. RICHARDS.

Mr. RICHARDS: Some difficulty has arisen in the mind of the last witness in consequence of the introduction in the 23rd clause of the sum of £500,000.

Witness: I should explain that there was a little complication in the re-settling of this bill. It was originally framed upon the basis of an Act obtained in July, 1857, for the city of Cork, and that was adopted as a precedent and model for the present bill. In that case we retained all the powers of the charter with respect to capital; we did not touch that, but we dealt with the Cork capital as a separate fund, allocating to Cork the amount expended there, and limiting the committee under the Gas Clauses Act to that; otherwise the charter of the company was not touched. The Gas Clauses Act was applied to Cork with respect to laying the mains, and the construction of the works; but as to the internal regulation of the company and the capital, the charter remained in force. This was the bill as it originally stood, but when it came before Lord Redesdale he required us to repeal the charter so far as it regarded the City of Dublin; it was necessary to keep it in force so far as regarded the works in Limerick, because no notice had been given of any bill with regard to Limerick, and the bill could not be applied to Limerick, nor was it intended to be so. The consequence was that it was necessary to lay the bill before counsel, and rearrange it. My instructions were that we should retain the powers of the charter as to raising the £500,000, the limit of the charter, and take power to borrow to the extent of £50,000. And, accordingly, a recital was introduced into the preamble of the bill, that the capital of the company was £500,000, divided into 10,000 shares of £50 each, of which 9000 had been issued and fully paid up. We then took power to issue the other £50,000. A clause was introduced into the bill, giving to the company power to raise their capital £50,000, and to apply it, if necessary, to the works in Dublin. Unfortunately in clause E a mistake has been committed "until augmented under the powers of this Act, the capital of the company shall be £500,000, divided into 10,000 shares of £50 each." That was taking the nominal capital as it stood upon the charter, so that on looking through the bill there would appear to be a power to take two sums of £50,000 each, which was never intended. All we intended was to keep the original power, and I propose to alter that into "until augmented the capital shall be £45,000, divided into 9000 shares of £50 each," so as to make it consistent with the preamble of the bill.

Mr. RICHARDS: It is not a mistake for which Mr. Ogg is responsible?

Witness: No; I am responsible if any one is.

The CHAIRMAN: It might enable the company to divide 10 per cent. out of the Dublin profits upon £50,000 more?

Witness: That was never intended, my lord. The other clause, I think, would prevent that. We could only have applied £50,000 to Dublin.

The CHAIRMAN: In clause 13 you took power to make the capital £425,000?

Witness: Yes.

The CHAIRMAN: And by the next clause you raise £50,000 more?

Witness: Yes; that is the object of the bill.

The CHAIRMAN: So that you would raise one sum by debenture stock, and another by mortgage?

Witness: Yes; but not two sums of £50,000 by stock. There was no such intention as that. We have no borrowing powers at present under the charter.

The CHAIRMAN: What limit is there to the interest on mortgage?

Witness: 6 per cent.

Mr. RICHARDS: It was necessary to raise money by debenture stock, I believe, because your shares were at a considerable discount?

Witness: Yes.

Mr. RICHARDS: What do you say with reference to the possibility of the loss sustained being made good out of money collected in Dublin?

Witness: We come under the Gas Clauses Act, which requires a separate account to be kept.

Cross-examined by Mr. O'MALLEY: We still retain in our bill that the capital is to be £500,000. The company is incorporated with a capital of £500,000, of which £360,000 is applicable to Dublin.

Mr. O'MALLEY: So that the capital applicable to Dublin, exclusive of what is to be capitalized by this Act, is £360,000?

Witness: Exclusive of what may be added under this Act, certainly; but another £50,000 may be added to that. This capital is to preserve our power as it stands, and to give us a power of borrowing £50,000, and for the purpose of limiting the dividends and giving the benefit to Dublin of any reduction to which they are entitled under the Gas-Works Clauses Act.

Mr. O'MALLEY: Now, when we come to the 15th clause in your Act of Parliament, will you show me what was intended? I will suppose the case of their requiring to spend £30,000 at Limerick, what is there to prevent them taking it out of that £360,000 capital, and applying it to Limerick—taking a portion of the capital which you say is to be assigned under the Gas Clauses Act to Dublin?

Witness: Why, merely because we have not got the money; it is expended.

Mr. O'MALLEY: But suppose that you owe £30,000 for your works at Limerick, and they take out an execution against the incorporated company, what is there to prevent them levying upon your works in Dublin, and seizing your stock?

Witness: We have no right to owe the money at all; we cannot contract a debt.

Mr. O'MALLEY: Your charter gives you the right to owe it for Limerick. Your charter is quite unrepealed with all its powers?

Witness: With great deference I venture to take a different view of the powers of the charter.

Mr. O'MALLEY: Well, now, supposing you had, as I believe was the case some time ago, to pay damages amounting to £500 for poisoning a cellar at Limerick, what is there to prevent you taking that money out of the money apportioned to Dublin?

Witness: You are supposing a verdict against us for £500, and you are asking whether execution should be issued?

Mr. O'MALLEY: Yes.

Witness: Yes; I suppose that would be upon the assets of the company. I suppose if we refused to pay a man he might levy where he liked.

Mr. O'MALLEY: We will suppose another case. Supposing there was competition got up at Limerick, and, for the purpose of maintaining your ground, you were selling gas at a losing price, what is to prevent your taking money out of your Dublin profits to pay for that?

Witness: The Gas Clauses Act, I apprehend.

The CHAIRMAN said that this was more a matter of argument than a matter of evidence.

In answer to a LORD, *Witness* said he apprehended that the £100,000 to be raised might be spent either in Limerick or Dublin, but certainly not in any part of the united kingdom. With respect to Limerick and Dublin, there would be but one dividend, but there would be two profits, or it might be a profit and loss. Separate accounts would be kept of the Dublin capital. There were not two sets of shares, one in relation to Limerick and one in relation to Dublin; the shares of the United Gas Company were applicable to the profit made by both. Any portion of the £50,000 raised at 6 per cent. upon the security of the works or property in Dublin, would be entered in the Dublin account. If the money was raised by shares it would bear an interest of 10 per cent.

Cross-examined by Mr. STEPHENS: I cannot conceive that the passing of this Act will affect the position of the people in Limerick in the slightest degree, and I will explain why it will not. We have no debts; we have nothing but debtors to us; we are creditors, if we are anything, at Limerick; all we have to do is to collect our rates and supply our gas.

Mr. *John Knight Boswell*, examined (in the absence of counsel) by Mr. GREGORY.

I have resided in Monkstown, and have expended a considerable sum of money in building there. I am also one of the commissioners. I have used the gas of the Hibernian Company, and I have had frequent communications with the officers of the company. These communications have always been satisfactory, and in the only case in which I ever made a complaint (which was last winter) the matter was rectified at once. The commissioners have entered into a contract with the company for the public lamps; and having regard to the number of lamps, the supply of gas has been sufficient in quantity, good in quality, and I believe moderate in price; but really on the latter point I am not competent to form an opinion. I may say that they have acted very honourably by us, because they voluntarily, after a short time, reduced the price of their contract with us.

Cross-examined by Mr. NORWOOD: With the exception of two or three of my fellow-commissioners, I believe they agree in the opinion I have just expressed as to the satisfaction which this company has given. I am not prepared to say that this voluntary reduction in the price of gas was not under the pressure of competition. Recently, since the Commercial Gas Company has come up, I have seen a few articles in the public press complaining bitterly of the present condition of the supply in Dublin. I never mind those trashy things; I know the way in which they are got up, and I do not care to read them. I believe there have been public meetings with respect to the present state of the gas supply; but I cannot charge my memory with what has occurred at them.

Cross-examined by Mr. BARRY: I believe the citizens of Dublin would object to pay more than they do now for gas; you know as well as I do that the City of Dublin is much overtaxed. I think it would be a great calamity if that bill was thrown out.

Cross-examined by Mr. STEPHENS: I am very anxious for the retention of the United Gas Company till we get a better. I offered a site to the Commercial Gas Company, but their refusal to take it has nothing to do with my appearance here to-day.

Mr. *Devett*, examined by Mr. BURKE.

I am a merchant residing in Dublin, and am a member of the Town Council. I think our lighting is of fair average quality. I have taken some trouble to look about me, and I take it our gas is better than that burned in London. I am quite satisfied with the supply. Mr. Sanders, I should say, is one of the best officers in Ireland. I never met a gentleman holding a public position who is more easily approached or more anxious to make things agreeable than Mr. Sanders. I believe he is a universal favourite in Dublin. I should say he has always been accessible as representative of the company in Dublin, for the redress of any grievance which may be felt, or for the purpose of giving such accommodation as may be required.

Cross-examined by Mr. NORWOOD: I am aware that some of my fellow-citizens have complained about the gas, but I cannot speak of the justice of the complaints; I have heard it stated that the sins of bad gas-fitters are put down to the company.

Cross-examined by Mr. BARRY: I am an advocate in the corporation for increasing the illuminating power of the gas, but not for increasing the price.

By Mr. STEPHENS: With regard to the companies, may we take it for granted that if a company started to supply a good article it would not be looked upon by you as a favour?

Witness: No, and I will tell you why. We are doing all we can at present to improve our roadway; and I look upon it as a positive calamity to the citizens should a third party have the right of tearing it up.

Re-examined by Mr. BURKE: What I desire is, that any company, having power to break up the roads, should be under parliamentary regulation with reference to the manner of supply, the illuminating power, and the price.

Mr. *Dance*, examined by Mr. BURKE.

I am a resident in the neighbourhood of Dublin, and am a justice of the peace, and chairman of the bench of magistrates of the township of Blackrock. As a consumer of the gas, I am perfectly satisfied with the gas supplied by the Hibernian Company. I am also a director of the Dublin, Wicklow, and Kingstown Railway; and, as such, I am perfectly satisfied with the supply afforded. We have never had occasion to make complaints with respect to the illuminating power of the gas supplied.

Mr. *William M'Cormis*, clothier, Abbey Street, Dublin, was also examined, and expressed his satisfaction with the quantity and the quality of the gas supplied. He also stated that he was a trustee of the Wesleyan Chapel in Dublin, treasurer of the Kingstown and Dalkey Wesleyan Chapels, and a director of the Metropolitan Hall, and he had every reason to be satisfied with the supply of gas to all those places.

Mr. *Frederick Piers Barnes*, examined by Mr. RICHARDS.

I am a civil engineer, and am surveyor for the township of Blackrock and Pemberton. About a year and a half ago, these townships applied to this company to be supplied with gas. The mains were laid down and the lamps erected as soon as possible, and since then the company have continued to supply gas to the township. I have been satisfied with the manner in which this has been done; there have been one or two little complaints, but when I mentioned them to Mr. Sanders he had them rectified at once.

Cross-examined by Mr. O'HARA: I have no knowledge of gas beyond general observations.

Mr. *William Connell*, examined by Mr. RICHARDS.

I am foreman of the Irish Gas Meter Company; they repair all the meters in the city of Dublin. The state of a meter after it has been used affords a good index as to the purity of the gas which passes through it. I have had opportunities of forming an opinion by that means of the purity of the gas supplied by the Hibernian Company, and, compared with meters which I have received from other towns in Ireland, I should say that it was particularly pure. Some of the Hibernian meters have been as long in use as 20 years, without being opened, and I found them in excellent condition, and good, and fit for use again. I should say that would not be possible if the gas was impure.

Cross-examined by Mr. O'HARA: I believe the purity of the gas is no test of its illuminating power; it is likely that you might have gas of very bad illuminating power, and still very pure.

Mr. *George Wright*, examined by Mr. RICHARDS.

I am district superintendent of the Hibernian Gaslight Company. I was inspector of public lamps in Dublin for 19 years. During the time I was acting there, the 20 years contract was in existence, and I believe the company fulfilled that contract faithfully in every respect. We had very few complaints indeed. We were lighting at that time about 2900 lights. I was in no way connected with the company, but rather acted as a check upon the company to report to the commissioners. I believe that on the whole the Hibernian Company give satisfaction to the private consumers. I test the gas; I find the average illuminating power is from 13 to 14 candles.

FRIDAY, MAY 26.

Mr. *George Wright* recalled, and cross-examined by Mr. NORWOOD.

I have had an opportunity of seeing the Hibernian Gas-Works from day to day for some time past. I am not practically acquainted with the most improved method of making gas, and of utilizing the residual products; that does not pertain to my office at all. I heard about five minutes ago for the first time that the present condition of these works, and the mode in which operations therein are carried on, are highly detrimental to the health of the inhabitants of Dublin. I am aware that a public meeting has been held within this last month, but it was not with reference to these gas-works. It was with reference to an unpleasant effluvium upon a particular night, but it was traced to a manufacturer of bone manure. It was stated by Dr. Waller and some other persons that they had every reason to believe it was not from the gas-works at all. I really do not remember Dr. Waller saying that the effluvium which pervaded the city was not an escape of gas, but it might have arisen in consequence of the faulty arrangements in the manufacture of gas. Any information I have got on the subject I obtained from very cursorily reading the newspapers the next morning. I am not aware that the disposition of the residual products upon the premises leads to a highly offensive and a highly unwholesome nuisance. With reference to purification, I cannot say whether the mode adopted by the company is the most modern. It is considered, I believe, that the best means of purification is by oxide of iron and chloride of lime. I am not aware that the generation of "blue billy" water on the premises is highly offensive, and that they pass this "blue billy" water into Curtis's manufactory, to the detriment of the public health. Neither have I heard that it is passed into the sewers, or that the Liffey is polluted by it. I cannot say that it is not so—I know nothing

about it. I do not remember that in my examination on a former occasion I gave any political information. I might have said at the time that it was not from competition that a reduction would result, but I do not remember it. There has been a reduction in price and an improvement in the quality of the gas, but I am not prepared to say that this arose from competition. The illuminating power of the gas supplied within the last six months has been 13·8 candles; previous to that it was 13 candles. I have a book here in which I have noted the illuminating power of the gas. I have no objection to your seeing it. Those are the notes made from time to time. The average of the gas within the last three years has been 13 candles. This is a book I kept at the City Hall, and I have another book in which I noted my experiments since that time. I suppose the corporation have the book, which I kept for them. I left all my books with them last August. No notice whatever has been served upon me for the production of these books. I have no business with them; they are not mine; they belong to the corporation. I am aware of the nature and use of Sugg's burner. This burner would show that the gas of 12·5 in 1860 would now be of an illuminating power of 13 candles. I find that the average at that time was more than 12·5.

Cross-examined by Mr. BARRY: I was paid jointly by the corporation and by this company for 19 years. My duty was the same as that now fulfilled by Mr. Cotton. I resided a portion of the time in Rathmines, and the latter portion of the time in Hardwick Street, in the centre of the city. I am now exclusively in the service of the company; they do not insist upon me living in the town. There is no stipulation of the kind at all. I inspect the public lighting almost every night. I will not say every night, but at least five nights out of the seven.

Mr. BARRY: And the other two nights was it left to take care of itself?

Witness: No; I generally tested the gas daily; it was my daily custom to do that before I left the office. I might not have made an actual inspection, yet the probability is that at the time I left the office the lights were lighted, and I should see them on my way home. I was informed from my own observation of the state of the lighting every night.

Mr. BARRY: You tested the gas by day in order to see how they were kept at night?

Witness: That would be about four o'clock. The condition of the lights in the course of a night may materially alters. The inspection of the photometer at four o'clock would give me no information as to what the condition of the lights at night would be. Of course the condition of the lights at night would be the important point. I was in the habit of acquiring information about what took place during the night from the officers of the company. The men were required to state to the officers any light not properly lighted; it was in order that I might know what was done. The average of the illuminating power for five years is about 12 or 13 candles; 13 candles would be very near the average, or 12·5, so that within the last eight months there has been an improvement of more than three hundredths. I swear that for the last eight months the average has been 13·8. I did not keep entries of the tests from day to day; in point of fact I kept no regular test of the lamps prior to 1862. There are occasional entries, but I do not think I kept a regular record such as you hold in your hand.

Mr. BARRY: How are you now able to swear to the average of the gas during five years?

Witness: I was in the habit of daily testing it from 1851 till I got the photometer.

Mr. BARRY: What kind of photometer did you use?

Witness: That of Church and Mann—the best in existence. It was on the same principle as the present. I have no means of knowing exactly when I first began to use Sugg's burner, but I should think it was about two years ago. Previous to that I used an iron burner—an Argand burner. It is the shape of the burner which makes a difference in the power of producing light. I was very anxious to have the best burner that was in use, and I have a letter here from Dr. Letheby, which I received on the 19th of May, 1857; and Dr. Letheby refers me to a party here who supplied me with the burner, and I used his burner, together with a burner which I got from the gas company, up to the time of Sugg's being handed to me. With respect to good gas as distinguished from bad gas, the good gas of course depends on its illuminating power. That is the main test. I should think 14-candle gas is the best that can be made from ordinary coal. Cannel coal gas is a different thing altogether; it is not recognized as an ordinary thing.

Mr. BARRY: I want you to tell me what you think the best coal gas at present known is.

Witness: There was an interpretation given to that in 1846 or 1847; it was construed to mean 12-candle gas—that is, gas tested with the ordinary Argand burner. A consumption of 5 feet, it was calculated, would produce 12 candles.

Mr. BARRY: I do not want what definition was given on any other occasion; I want your own definition. Will you swear before the committee the best gas means 12-candle gas, tested by an ordinary Argand burner?

Witness: Yes; I should consider I was satisfied with that.

Mr. BARRY: Is that, in your opinion, the best coal gas?

Witness: It was the best coal gas at the time that expression was made use of. In the year 1863 I think 12-candle gas would have been the best coal gas as expressed in illuminating power, but since then a larger standard has been given to it, and it has involved the use of a larger quantity of cannel coal.

Mr. BARRY: What was it in 1862?

Witness: 13·8, the Dublin gas.

Mr. BARRY: Now, as to 1864: supposing you were asked, as a practical man, how do you define it in illuminating power?

Witness: By what I find proved, it was not below 12 candles.

Mr. BARRY: Then you think, in 1864, 12-candle gas would satisfy the requirements of a contract for the best gas?

Witness: I should. I never found this company's gas as low as 7 or 7½ on any one occasion.

Mr. BARRY: Is that your handwriting? [Mr. Barry here handed a letter to witness.]

Witness: It is.

Mr. BARRY: Refreshing your memory from that, will you adhere to your answer that you never found it down to 7 or 8 candles? It says, "I therefore proceeded with the experiments with the most careful manipulation; and I found the quality of the gas to be equal nearly to 7·5 candles."

Witness: Yes; 7·5.

Mr. BARRY: Will you now adhere to your answer that you never found it down to 7 and a fraction?

Witness: That is an isolated case. I suppose I may be allowed to read the whole of the letter?

Mr. BARRY: What is the date?

Witness: The 30th of December, 1861. It is a letter addressed to the secretary of the gas company. [The witness here read the letter.] I now remember that quite well. I was down at the gas-works. I was not accustomed to that photometer, and the engineer afterwards assured me it was not so, and that I was not testing the gas properly, as I well remember now. I remember the circumstance perfectly well now; but that the quality of the gas was bad at that time I have no doubt.

Mr. BARRY: I find the reason given for it here was that the company's servants were drunk, it being Christmas time?

Witness: Yes.

Mr. BARRY: Which was it—that the company's servants were drunk, or that you were mistaken in your photometer?

Witness: Perhaps both reasons might have been given at that time. I certainly remember the engineer saying I was not testing the proper gas. I am not aware that the old company refused to renew the contract containing the words "the best and purest gas." At the time that expression was made use of, or was introduced into the contract, the means of testing gas were not very satisfactory, and that was a general term which was considered sufficient for the purpose. Since that time photometric apparatus has considerably advanced. I should imagine that the company would prefer a distinct quality laid down rather than those which appear to be arbitrary. I am aware that the words "best and purest gas" were last Wednesday introduced into a Liverpool bill, but that is a different gas, and it would not be applicable to Dublin. The gas is improved by the proportion of cannel coal used in its manufacture. I cannot say the proportion at present used by the Hibernian Company. I do not know what the price of cannel coal gas in Liverpool is. I know it is very low. I cannot say what difference there will be between the same article in Dublin and Liverpool. The means which I adopted for testing the quality of gas that went through the public lamps were the pressure gauge, and afterwards putting the burner upon the the experimental meter—the test as laid down in the contract.

Cross-examined by Mr. STEPHENS: I know the works at Mount Town. There has been a complaint about these, but it arose from an accidental circumstance. There was some land spring discovered, which carried off some of the waters from the purifiers, and this polluted a stream somewhat near it, but it was immediately removed, and since that (nor previous to that) has there been any complaint. I knew nothing about the supply of gas previous to my appointment. I do not know anything of the company's mode of collecting its accounts. I do not know that anybody has expressed dissatisfaction that the collectors are charged a per centage on the amounts that they do not collect. I am not aware that the company has refused to bind itself to supply more than 12-candle gas. I have heard complaints from customers, but every complaint received attributed to the quality of the gas is, in perhaps nine cases out of ten, from some local defect—that is, a defect in the fittings and the burners. As I said before, I am not aware that the company refuse to give more than 12-candle gas; on the contrary. My first interview with the directors of the company was about 12 months ago. Previous to that time I did not know any of the directors, but I happened to be in London, and Mr. Sanders was staying at the same hotel. He introduced me to the directors, and asked me if I had been satisfied with the quality of the gas, and I said that I had been so generally; then they said, "Our wish is to give 14-candle gas, and plenty of it," and they have done so since that period.

Mr. STEPHENS: You have stated that 13-candle is the maximum?

Witness: It is often over 14.

Mr. STEPHENS: Have you stated the average as 14?

Witness: No, I have not. I was appointed to the office which I held in July, 1845. I was the medium of communication between the corporation and the gas company. With reference to good gas, I should consider gas free from ammonia and sulphuretted hydrogen good gas. By "sulphuretted hydrogen" I include sulphur in any form. I do not know whether, under the present proposal of the company, any security has been taken that the gas to be supplied shall be good gas of that kind. I think it is a very important thing to satisfy the citizens on that point, and that there should be such a provision. I think I should have recommended the introduction of such a provision, but I was not consulted at all with reference to it. I believe that in English bills stringent provisions are introduced with regard to the purity of the gas, and I think I should consider a bill defective which did not contain these provisions. With regard to the testing, the photometer is a test of the illuminating power of the gas at the time. The illuminating power varies—it is not steady to one particular decimal.

Mr. STEPHENS: Within what period can you detect these variations?

Witness: As long as you have the photometer under your observation but not after that time.

Mr. STEPHENS: Supposing the quality of the gas changed—suppose it might be for one 10 minutes 13·8 candles and another 10 minutes 13·5 candles?

Witness: It could not be from the same source; it might be supplied from a different source. Then it could only be ascertained at the point at which it was delivered. There is no doubt that within an interval of three hours from the time of taking an observation it would be possible materially to change the quality of the gas, because it might be delivered from a different gasholder.

Re-examined by Mr. BURKE: If a company guarantees 12-candle gas, they must in reality work up to 13 candles to secure 12, and it would not be safe for a company which guarantees 12-candle gas to work at less than 13. Many things affect the illuminating power of the gas; in different states of the weather you find different results. There is no doubt the gas company claim the right of taking that burner which will show the best combustion of the gas.

Mr. BURKE: Is it impossible in any gas-works to make all the operations of the gas company without very ill effects?

Witness: I am not aware.

Mr. BURKE: There is no modern improvement for turning the residuum into the smell of violets?

Witness: I have visited several in London, and I have found the odour from all to be the same; so that, if Dublin is to be supplied with gas, it can only be supplied with the amount of smell which arises from the residual products.

Mr. BURKE: Have the company adopted every rational expedient for preventing that?

Witness: I cannot say, I am sure; but I have always observed a great desire on their part to do so.

Mr. *John Murray*, examined by Mr. BURKE.

I reside in the township of Kingstown, and have been a consumer of the Hibernian Company's gas. I have always found the gas good and sufficient, and have had no cause to complain. I know of no reasonable cause of dissatisfaction with the Hibernian Company's gas, and I do not consider it at all necessary that an additional company should come to supply Kingstown with gas. I do not see how two companies are to be supported by the population. I should object to the breaking up of the public roads at Kingstown for the purpose of laying down the mains of another company. I know the site of the Consumers Company; it is on a small portion of the old harbour of

Kingstown, which the railway has cut off. There is not a single particle of ground to be had there; it has all been built upon with handsome houses. Along the west of the harbour there is a public promenade, and the west pier is a public promenade, and has been much improved by the Board of Works. I think a worse site could not have been chosen for the erection of a gas-works, as far as the public are concerned. No matter in what way the wind blows they must smell the gas. If it is from the north, there are all gardens up that way; if it is from the west, all the houses along Longford Terrace must suffer; if it is from the east, it carries it down to the clubs along the road; and if it blows from the south, it takes it to the people on the west pier.

Cross-examined by Mr. NORWOOD: I am not acquainted with the manufacture of gas further than what I have read. I know nothing about modern discoveries, or what they might do. Lords Longford and D'Vechi have a large and considerable property at Monkstown.

Mr. NORWOOD: Do you think it is likely that these noblemen will do anything to injure the value of their property?

Witness: I do not know how that may be, one way or the other, but the letting of this land will injure their property.

Mr. NORWOOD: Do you not think that they ought to be the best judges of what is for their own interest?

Witness: I think their agents have made a great mistake from first to last. I am not aware that the Board of Works have sanctioned the taking of the ground for the Commercial Company. The census return of Kingstown shows the population a little over 20,000; but that census return was taken in June, and that is no criterion of the population of Kingstown in winter. In June, July, and August, Kingstown is full of many visitors. Kingstown is governed by a body of Town Commissioners; I have never heard that the Town Commissioners have expressed the greatest dissatisfaction with the position of the township, as regards the public lighting by the Hibernian Company. I am not aware that a number of the public lamps remain unlighted at the present time, in consequence of the refusal of the company to lay down the necessary mains. With respect to complaints from the inhabitants, the only complaints I have heard of have arison from the occupiers of an inferior class of houses who complain that the landlords will not introduce gas for them, but not in relation to the supply of gas. I am not aware that the commissioners have complained that the mains laid down are so defective that the public sewers cannot be kept free from the escape of gas. I know nothing about either the Commercial Gas Company or its shareholders. I suppose I burn 15 or 16 lights in my own house. I do not burn any in my bed-rooms, or in my drawing-room. It is not a becoming light for ladies in a drawing-room in my opinion. I have never found the heat evolved from the Hibernian gas oppressive. I have worked a great deal by it. I am well acquainted with the city of Dublin. I have heard that a memorial to the Lord Mayor, within the last six or eight months, was presented, signed by a large number of the consumers of gas in Dublin, asking him to call a meeting upon the subject. I do not remember that resolutions strongly condemnatory of the Hibernian Company's gas were passed.

Cross-examined by Mr. STEPHENS: It is about three-quarters of a mile from the Hibernian Gas Company's works, at Mount Town, to where I live. I never stated to any one that the advent of the Commercial Gas Company at Kingstown was hailed as a boon by the inhabitants, and that their only objection was the site.

Re-examined by Mr. BURKE: I do not think you will get much better houses in the locality than those where I reside. Notwithstanding the promoters of the Commercial Gas Company promising to make an inodorous gas, I do not see how it is to be made without odour. As I said before I know nothing about the gas escaping into the sewers, but if it is so I should say that those who have the control of the sewers would have their legal remedy.

Mr. *Talbot Coalt*, examined by Mr. BURKE.

I am a house-agent living at Kingstown, and have lived and carried on business there for 21 years. I am well acquainted with the manner in which the houses in Kingstown are supplied with gas. I heard the evidence of the last witness, and I concur in the evidence of that gentleman as to the sufficiency of the gas supplied by the Hibernian Company. I also consider the quality good. I mix a good deal with the inhabitants of Kingstown, and I have never heard of any complaint in my life against the company. I have seen the petition of the inhabitants presented to this House.

Mr. BURKE: Does that petition, in your judgment, fairly represent the inhabitants of Kingstown?

Witness: I should be sorry to suppose that Kingstown was so far gone as that. I do not think that a second company is wanted in Kingstown. I think that the gas in Kingstown is equal to the gas in London. I think that the roads are as well lighted as in London; but it is not supported by the lights in the private shops as in London.

Cross-examined by Mr. O'MALLEY: I am not connected with this company, nor with the Kingstown Railway Company. I say upon my oath that I never heard of great dissatisfaction in Kingstown about the gas, and I mix with all the people in the place.

Cross-examined by Mr. STEPHENS: I believe there are twelve commissioners, but I am not quite certain.

Mr. *William Romans*, examined by Mr. BURKE.

I am the resident engineer of this company at Dublin, and I have charge of the Dublin, Kingstown, and Bray works. In my opinion, the works at Dublin, Kingstown, and Bray, are more than adequate for the present supply of the district which we light with gas; indeed, they are adequate for a considerably increased supply. If our works required a further enlargement, we have ground to double the manufacture in Dublin, and to treble it in Kingstown. The coal we principally use is Pelaw Main—Newcastle coal. This is about the best description of Durham coal for gas purposes, and independently of cannel coal, there is no coal which will produce the quality better. I adopt all the best modes of manufacture that I know of; the instructions I have are to make the gas as pure and innoxious as possible. In London generally, they have been adopting oxide of iron for the purification of the gas, but there is a great difference of opinion as to whether oxide of iron or lime is the better process for purification. Oxide of iron is the more noxious, as regards the immediate neighbourhood. We have always endeavoured to keep up a good illuminating power in our gas. Coal such as I have described is only capable of giving a certain amount of candle gas, and, to keep up that standard, by the order of the board we have to use a per centage of cannel coal. In order to enable me to satisfy the testing inspection I have to manufacture the gas upon the works a candle or a candle and a quarter stronger than 12-candle gas to keep myself safe with the public. I keep a testing apparatus at the works, which is constantly in use. We have also a proper photometer upon the works. It is always our effort to maintain gas at a standard of at least 13 candles; and if by this bill we are compelled to give 14, we shall have to use 4 or 5 per cent. more of cannel coal. The gas we supply in Dublin is superior to the gas supplied in London, but it is supplied at the same price, namely, 4s. 6d, while Parliament has required it to be the standard price in London. If we give 14 candles we shall be giving 2 candles above the London standard at the same price, and we shall be obliged to manufacture to nearly 15 candles to produce that. I have made a valuation of our works. Knowing that our bill was for three places, I have taken it all under one head. I estimate the total of the plant is £261,941, including a floating capital of £36,000, making a total of £297,941. We cannot keep on a work of this magnitude without a considerable floating capital.

Mr. BURKE: Taking that as a per centage of £36,000 upon £261,941, would it afford a fair test of what is the usual floating capital of a company of that description?

Witness: I should have been almost inclined to have had £50,000. Dublin is a peculiar post. We are obliged to have in November upwards of 17,000 tons of coal stacked to make us safe to go through the winter. With reference to the complaint that has been made of a nuisance at Mount Town Works, it arose from the surface water getting through. There was an old sewer which we did not know much about, that ran through the works. That sewer was made of loose granite stones alongside one another, covered with some rough granite blocks; and from some unknown cause, the surface water washed some of the refuse lime, or some of the matter belonging to the works, through the soil. Immediately a request was made to me from the agent, saying so and so was the case, I went down to Mount Town. I laid a pipe nine inches in diameter, and carried that sewer right through the work, so that any weepings could not enter that sewer again. It was merely a temporary inconvenience, which was remedied immediately it was discovered, and it was an annoyance incidental to every work of the kind. I remember a complaint of Mr. Wright, the official person acting for the corporation. He came to the works, and I think the first party he saw was Mr. Douglas, my assistant. The cause of the complaint was this:—Our men, from some cause or other, got rather in a drunken state. We had not such a large quantity of retorts to fall back upon then as we have now. If they got into a difficulty their stock got low; consequently the stock of gas not only got low, but the pipes got stopped up. The retorts were superheated, and not charged. I might have allowed the town to have been in darkness altogether. It was only a temporary thing. I thought it better to keep the light going than allow darkness to go all over the city. That is the only case I have known since I have been there—five years. The commissioners of Kingstown have applied to us to lay mains, and we have done so. Some six weeks ago we laid 300 yards to light only two lights. I should say that would be a loss to the company. And there is another case at Dorking. Last summer we laid 6000 yards of main, and we only made sure of 26 lamps.

Cross-examined by Mr. O'MALLEY: It has been since this bill was in Parliament that this 300 yards was laid. I went from London to Dublin. When I was in London I was resident engineer on the Pancras station of the Imperial Gas Company, and now I am resident engineer of the whole of the works for Dublin. My experience and knowledge extend over five years, and during those five years the illuminating power, on an average (I will not say any particular night), has not been less manufactured at the works than 12½ candles. I have the book of my photometrical observations here; it was kept at my office. The amount of cannel coal we use depends upon the kind of cannel coal, and where it comes from. We are now using Boghead. We also use Wigan and Scotch cannel. There are, of course, different qualities of cannel coal. The best that can be got is the Boghead. I believe the price of Boghead is upwards of 50s. per ton, but I will not state that upon my oath. You must ask the secretary for that. With respect to the other coal, the Marquis of Lothian's costs 33s. a ton, and Wigan about 23s. or 24s.

Mr. O'MALLEY: Can you tell me, as to Boghead, Wigan, or Scotch cannel coal, or whatever it is, what per centage you use in the gas?

Witness: When I use Wigan I use from 5 to 6, or sometimes 7, per cent.; but when I use Boghead I use from 2½ to 3 per cent.; and when I use the Marquis of Lothian's, it is 4½ to 5 per cent. I have been using that cannel coal ever since I went to Dublin; I found it there. I used it as they did in London. We use Sugg's burners, and have done so for a number of years. I used Sugg's burner in London. I use an iron burner now as well. The officer of health visits me occasionally; I do not know that there has been any difference between us. I had no complaint from the Board of Health respecting Kingstown.

Mr. O'MALLEY: I am now speaking about Dublin; do you know of a public meeting being held at which the sheriff of the city presided, and at which the agents for Lord Herbert and Lord Palmerston were present, and some of the most influential men of the city of Dublin, the Lord Justice of Appeal amongst the rest, moved a resolution, and a complaint was made against your company for contaminating the air, polluting the drains and the Liffey, by your gas-works?

Witness: I saw something respecting it in the papers, but they did not known where it was coming from. One councillor said his nose assisted him in coming to the conclusion it was not from the gas-works. I am not aware that our resident manager, after the usual period for communicating with the London directors, promised it should be abated by the 1st of March, and that certain processes should be introduced for the purpose of getting rid of it. I have always given the officer of health every facility (and if he is here he will state so) to inspect the works whenever he pleases.

Mr. O'MALLEY: May I ask you what new works have you constructed since you went to Dublin?

Witness: I may say to a large extent Kingstown has been newly made since I have been in Dublin. When I went I found works at Kingstown of a very small nature. The works altogether cost about £8000; we did not not lay out all the £8000 upon them, we found a small part of the works there. I am not in a position to say what we have laid out upon them since I went, but what I say is that the old and new works together cost £8000. We have also improved the works at Bray to some extent. We have come into Bray very lately. I do not know that I am in a position to explain what this floating capital of £36,000 consists of. It is the secretary's duty. There is one particular item I mentioned to you, and that is coal. Then we have bricks, and retorts, and pipes—a large stock of each. I mean that we have on hand stock to be applied in works of reconstruction and repairs. I know the officer of the Board of Health as a Dublin gentleman. When he called upon me at the works I understood it was for a general survey; he comes and surveys the works to suit his own convenience. He complained to me on the subject of this nuisance which I have been speaking of, and I promised to adopt every means to prevent these noxious emanations.

Mr. O'MALLEY: I understood you, a little while ago, that no complaint had been made to you.

Witness: Not since that meeting. No general complaints that I know of were made. He came to me in a conversational way, asking my knowledge of how gas was purified, and what I looked upon as different improvements respecting the purity of gas. I told him the directors were particularly careful to keep everything as pure and as clean as they possibly could. I told him I would write to the directors, and tell them that he had been there.

Cross-examined by Mr. BARRY: Up to 1863 the averages of the illuminating power were about 12·6. That was at the works.

Mr. BARRY: At a distance of 1000 yards from the works the illuminating power would be at least a candle or a candle and a half less than at the works?

Witness: I am not prepared to say that there is no power lost, but I venture to say it would not be a candle. It would be half a candle, perhaps. This would arise from the difference in the temperature of the gas; it is an unintended condensation.

Mr. BARRY: When you had it at 12 candles and $\frac{4}{100}$th parts, it would be less than 12 candles in the street?

Witness: Not much below 12.

Mr. BARRY: If you deduct half a candle from 12?

Witness: You will find that the average in that book is above 12. Up to 1863 we were working under 13 at our own works, but it would be about 12 candles in the streets. In August, 1863, the averages begin to increase. We principally used Sugg's burner after that, so that the increase in the average from 12 to 13 was produced by the change of burner. Sugg's burner gives a better combustion.

A LORD: Then I suppose that up to that time you had been giving gas a good deal above it?

Witness: Yes; but I was not testing with a first-class burner.

Mr. BARRY: You were testing it with a burner of 1860. It was after the passing of the Metropolis Gas Act.

Witness: We were getting improvements in gas, and the gas companies were justified in using it. The public had the same opportunity.

Mr. BARRY: The public do not use these Argand burners at all?

Witness: Yes.

Mr. BARRY: Do you mean to say the public use Argand burners in the street-lamps?

Witness: Certainly not.

Mr. BARRY: Then it makes no difference on earth whether you lost the gas through Sugg's burner or another burner?

Witness: Yes; because the burners in the public lamps are of the same material as the Argand.

Mr. BARRY: Is it not construction, and not material?

Witness: The material makes as much difference as the construction.

Mr. BARRY: Do you mean to tell me that the bat's-wing burner and the Argand burner, being made of the same material, will produce the same results?

Witness: I tell you that a bat's-wing burner will give you a superior result to the old fashioned burner.

Mr. BARRY: Is that an answer to my question? Take this gas, showing 12 candles by your Argand burner, how many will that show by a bat's-wing burner? I give you the best bat's-wing burner that can be constructed?

Witness: Four feet of gas in a bat's-wing burner will give you an illuminating power of from 8½ to 9 candles.

Mr. BARRY: Though showing 12 by an Argand?

Witness: That is 5 feet of gas per hour.

Mr. BARRY: Take this test and apply it to the gas which gives 12 candles; how many will that show in the streets of Dublin through a bat's-wing burner?

Witness: The bat's-wing burner in the streets of Dublin has to pass 4 feet per hour; then I say you get 9 candles out of it at 4 feet per hour. The Argand is 5 feet per hour, tested to a good standard. In order to increase the illuminating power it would merely be necessary to use a greater per centage of a superior class of coal. As an engineer I will not say that in 1860 12-candle gas was the best that could be made, but it was the best which was generally known. It was allowed in London to be a gas satisfactory to the public. I do not know how many towns in England in 1860 were getting beyond 12-candle gas. We have the contract for supplying the Kingstown Railway Company with coke.

Mr. BARRY: I believe best coke worst gas?

Witness: No.

Mr. BARRY: It is rather that.

Witness: No.

Mr. BARRY: Do you mean to say that if you take all you can in the way of gas out of coal the coke will not be rather the worse for it?

Witness: It depends upon the description of coal you use.

A LORD: The more you extract out of coal the worse the gas gets.

Witness: Yes; in the process of making gas the best comes off first. We are not desired to take a certain amount of gas from the coal.

Mr. BARRY: What is the illuminating power that you are directed to take?

Witness: As near 14 candles as I can produce it.

Cross-examined by Mr. STEPHENS: With regard to this coke the contractors must take the coke which we have to supply; they use part coal—in fact, to a large amount. We get our coal from Newcastle; we could get it from Liverpool, but it would cost more. I am not prepared to say what is the freight across the channel. It varies according to the time of year. I am not prepared to state it is as much as 6s. 6d.

Mr. STEPHENS: How many feet of gas can you get from a ton of coal?

Witness: You can get about 10,000 feet; not quite that. I do not think you can get that. It is very first-class coal when you can get that.

Mr. STEPHENS: Well, take the freight (say) at 5s., and the gas at 10,000 feet. Would not that be at the rate of 6d. per 1000 feet?

Witness: You have made it up so.

Mr. STEPHENS: It is stated by one of the witnesses that 4s. was not an uncommon price to pay. I take it at 5s. as an average, and that would be 6d. per 1000 feet. In Liverpool it has been stated the gas companies make this cannel coal gas for 3s. 2d. per 1000 feet.

Witness: I think you have better guides in London. London is 12 candles, which is about 4d. per candle.

Mr. STEPHENS: Liverpool is supplying 20-candle gas at 3s. 2d. per 1000, and they are dividing dividends of 10 per cent.

Witness: You cannot compare it with Liverpool; Liverpool has a monopoly of the city entirely; it has the entire lighting. Generally speaking, a monopoly would not have the tendency to make the price higher instead of lower; quite the reverse. I was responsible for cutting off the 10,000 yards which we have heard of; if I considered these worth removing I should have done so. When I took up these works, five years ago, I certainly was dissatisfied with them, and I commenced making what I called improvements. As far as I could at the time I introduced the London system of working. I gave you the general statement for Dublin, Kingstown, and Bray. I think you could get from the parliamentary agents the different items. I stated that for Dublin, Kingstown, and Bray it was £261,941, and floating capital £36,000, making a total of £297,941. I can, however, give you the details; they are as follows:—

Estimate of Plant belonging to the United General Gas Company, Dublin.

	£
No. 1 gasholder	8,000
No. 2 gasholder	8,000
No. 3 gasholder	10,000
No. 4 gasholder	11,500
No. 5 gasholder	1,500
Retort-houses and retorts complete	15,000
Boilers	1,000
Engines, exhausters, and connexions	2,500
Condensers, scrubbers, pumps, and tar-tanks, and ammonia liquor ditto	5,000
Purifiers and connexions	2,500
Station-meter, and house	1,000
Yard-mains and valves	1,000
Coal stores and other buildings	13,000
Offices, foreman's house, and gatekeeper's house	1,200
Street-mains, Dublin, at 10s. 6d. per yard	106,000
Ditto services ditto	7,000
Consumers meters	30,000
Mount Town Gas-Works and mains	21,000
Ditto street services	704
Bray Gas-Works, mains, and services	5,000
Public lamps, Dublin	14,872
Ditto Blackrock, Pembroke township, and Dealkie	1,665
Value of company's interest in land	5,000
	£261,941
Floating capital	36,000
Total	£297,941

Mr. STEPHENS: Now is not that about half the amount of capital proposed by this bill?

Witness: I have nothing to do with it.

Mr. STEPHENS: Taking the bill at £525,000?

Witness: I did not put it in, but there is a good deal that we ought to put into that; there ought to be some two or three years rental for goodwill. I said that one reason why oxide of iron was adopted as a purifying process in London was that it is difficult to get rid of the lime there. Our lime in Kingstown is taken away by a Mr. M'Cormick; he has a contract to take it away. He carts it away to the farmers and people in the neighbourhood.

Re-examined by Mr. RICHARDS: In Dublin we use all the lime we have for luting—that is to say, we turn it into a paste for plastering up the mouths of retorts. In speaking of the value of these several works in Dublin, Kingstown, and Bray, I have taken no credit for what is generally called goodwill. I know the general custom in valuing things of such nature is from two years to two years and a half rental. If our rental is £70,000 a year, it is two years and a half for the goodwill, or £180,000. Of course, in all gas-works, there must always be a considerable amount of depreciation, and it would be difficult to find any manufactory the present value of which would represent all the money expended upon it. I stated that we got about 10,000 feet of gas from a ton of coal, but we do not get paid for anything like that. I dare say we do not get paid by 25 per cent. The 20-candle gas talked of in Liverpool is entirely cannel coal; it is impossible to get 20-candle gas from Newcastle coal.

Thomas Greaves Barlow, Esq., examined by Mr. RICHARDS.

I am a civil engineer, residing in Parliament Street, and have been consulted for more than 30 years in matters connected with gas—as much, perhaps, as any engineer in England. I have been acquainted with Dublin 40 years. My father was the engineer of the original Dublin Gas-Works. He erected those works himself in about 1821 and 1822. I was first consulted by the Hibernian Company in the spring of last year. I have been acquainted with the works of the Alliance Company for many years, and with those of the Hibernian Company about 18 months. Bringing to bear the knowledge I have acquired with reference to gas matters, I consider that the works of the Hibernian Company are amply sufficient to supply the present demand of gas in Dublin, or that part which they are called upon to supply. Both the Alliance and Hibernian works are well situated for the economical production and distribution of gas. In April, 1864, I tested the gas of the Hibernian Company. I tested it in the ordinary way, by burning 5 feet per hour, and the result obtained was an illuminating power of 14·84 candles. They knew that I was there, and that I was about to test the gas. I do not know whether they made any alteration in it. I tested it again last month, when the illuminating power was 15·54. Those are the only two occasions on which I have tested it. I employed a burner that developes the luminiferous properties of the gas. The gas was entirely free from sulphuretted hydrogen and nearly so from ammonia. Practically, it is not an advantage to free gas entirely from ammonia. Ammonia does not affect the illuminating power, but it facilitates the deposition of naphthaline. Naphthaline is a material which chokes up the pipes, but ammonia keeps it in a state of suspension—in a state of vapour. I know the gas all over London, and on the average the Dublin gas is superior to the London. There is one company in London which supplies exclusively cannel gas; it gives the same light with a smaller proportion of gas. I saw the photometric apparatus which they had in Dublin, and I consider it a fit and proper apparatus.

Mr. RICHARDS: Do you confirm what you have heard as to the great importance attached to the species of burners—that you may use a good or bad burner affecting the quality of the gas?

Witness: The illuminating power is increased as the pressure under which it is burned is reduced. The same gas burned under one pressure will give one illuminating power, and burned under another pressure will give another illuminating power.

A LORD: What is the reason of that?

Witness: It is quite evident that the best results are obtained from a flagging flame. If you force the gas through a small aperture you diminish the illuminating power, but by enlarging the aperture you diminish the pressure under which combustion takes place, and obtain a better result.

Mr. RICHARDS: You require a low pressure?

Witness: Yes. It depends very much on the perfection of combustion. At a low pressure, with the draught produced in a particular way, you get the most perfect combustion, and therefore the most light out of the gas. There was in 1847 a report in which it was said that the gas supplied was 17-candle illuminating power. I do not think the report states the manner in which that power was ascertained, but I know how it was. It was obtained by means of what was then termed Dr. Fox's shadow meter. [Witness here produced a long tape.] One end of this was put round the burner, and the candle was held along this tape. By means of this bar a shadow was projected on this piece of paper, and the candle was moved backwards and forwards till the shadows were presumed to be of the same intensity; and whatever was the position of the candle, on the scale marked here, that was taken to be the illuminating power. Such a mode, however, is the crudest possible, and not attended with the most satisfactory result. Seventeen-candle gas has never been obtained from 5 feet of Newcastle coal gas in my time, and if you increase the illuminating power it can only be

done by an admixture of cannel, and then the price of the gas must be increased. I think it a better plan to employ a moderate per centage of cannel coal to produce a 14-candle gas—I mean better for the public—than to produce entirely cannel gas. The deposits of cannel coal throughout the country are very limited; with the exception of one at Wigan and two or three fields in Scotland there are no others that I know of. There are none of importance at Newcastle, or in the midland districts, and therefore the source of the supply of cannel is limited, and is in process of being exhausted. The best description of Boghead, when it was brought into the market in 1851, was 16s. a ton at the shipping port, and now it is 45s. a ton. In my opinion it would be unfair to impose a higher standard than 14 candles on the Hibernian Company, unless they had the power of raising the price, and if they did that the Alliance Company would be able to step in and undersell them. I have only partially considered the question as to the value of the existing works at Dublin belonging to the company. The view that I took was this: I know what the Alliance works cost and what their production is, and comparing the two—what the Alliance have cost and the Hibernian may be worth—I should come to the conclusion £280,000. That includes floating capital, which I should put down at £30,000.

Mr. RICHARDS: Do you add anything for goodwill? Supposing another company or another person were to come in and plant themselves in the position which the Dublin Company are occupying, would they not have something to pay for the length of time that the Hibernian Company have been getting together their business?

Witness: In case of sale it might be so, but I do not see how in an Act of Parliament goodwill can be taken into consideration. With respect to the works at Bray and Kingstown. I have seen them, and I should think the two together may be taken as worth about £35,000, including floating capital.

Cross-examined by Mr. BARRY: Gas of higher illuminating power does come cheaper, though you have to pay something for it.

Mr. BARRY: Supposing we get in Dublin 20-candle gas at 5s., would not that be a cheaper article than 14-candle gas at 4s. 6d.?

Witness: Yes; as long as you can get it. My difficulty in dealing with cannel gas is the difficulty of seeing my way to the continuance of a supply. The deposits of cannel coal in the bowels of the earth are so very limited, that in about 20 years the great bulk of it will be exhausted. I think that opinion is universal. My notion was that in London, instead of supplying one or two small districts with cannel, it would be better to spread the same quantity of cannel all over London, and improve generally the quality of the gas; in short, to bring the 13-candle gas up to 14 candle. I know that in London there have been for many years great objections to the use of cannel on account of the difficulty of burning it without smoking. When I made the test in April last, I made it at the office in Lombard Street, which is about three-quarters of a mile from the works. It was at a quarter past two in the afternoon. Mr. Hawksley was with me. If they chose to make any alteration in the quality of the gas they could do so, but I have no knowledge of it.

By a LORD: Do you say that there is a greater quantity of smoke from the cannel gas than from the other kind of gas?

Witness: Yes, if it is not properly burned.

A LORD: At what degree of illuminating power does the gas arrive giving the full power through the bat's-wing?

Witness: The advantage is in favour of the bat's-wing above 18 candles.

A LORD: So that if you get 18-candle gas, that gives the consumer, through his bat's-wing burner, the full benefit of the light?

Witness: And so does an Argand.

A LORD: Up to 18 the advantage is on the side of the Argand?

Witness: Yes.

Cross-examination continued: The principal causes of complaints from consumers are from deposits of naphthaline. As I said before, I consider the photometric test by the shadow very defective as compared with new ones. With the Bunsen photometer you may arrive at tolerably accurate results, but they require great care in the manipulation. The Metropolitan Gas Act left it to the company to provide the burner that would best develop the quality of the gas. Any burner that a company can use, the public may avail themselves of.

Cross-examined by Mr. O'MALLEY: Does mixing cannel coal for the purpose of making gas injure the coke?

Witness: That all depends on how it is used; if it is mixed with the Newcastle coal it does deteriorate the coke, but if the Newcastle coal is distilled in one retort, and the cannel in another it would not be so.

Mr. O'MALLEY: You have had a great deal of experience in these things, what do you say to this proposition: "gas being an absolute necessity for both public and private consumption, the only sure protection against monopoly and consequent high price is in making the consumers themselves the manufacturers and proprietors. In a consumers company alone is it to the interest of the proprietary to ensure and obtain the lowest price, together with the purest quality and fullest illuminating power." Is that true?

Witness: Theoretically it is so.

Mr. O'MALLEY: Practically?

Witness: Practically it is not, because you cannot keep the shares in the hands of consumers; after a few years the original shareholders sell some of their shares, or they may die, and the shares get into other hands by various means. I was offered the situation of engineer to the Southampton Consumers Company, but I declined it from the commencement. I was not employed by them up to the moment of their going to Parliament. I made a report to them, but I did not embody those opinions in that report. I am the proprietor of a paper devoted to the subject of gas, but those opinions have never been advocated in my journal. I do not recollect whether I have said that if a company now started, with all the advantages which experience and scientific improvement could give, I could erect their works and lay down their mains with less waste and less money than those of an older company, but certainly that is my opinion.

Mr. O'MALLEY: It has been for some time in your experience that it frequently happens that when companies have old broken-down works that they renew their works and charge it out of income?

Witness: That is the proper mode.

Mr. O'MALLEY: And not out of capital?

Witness: The proper mode is to keep the plant up by renewals to its original value.

Mr. O'MALLEY: And it is an unfair thing to charge those to the account of capital against the public?

Witness: If they are simply renewals, but if they are extensions that is another thing.

Re-examined by Mr. HOPE SCOTT: With respect to the consumers manufacturing, no doubt if you can suppose all the consumers to be shareholders, and no consumer to have a larger interest in shares than he has in the price of gas in his house, and you can keep the body in that condition, it would be the best form; but if the interest of the shareholders exceeds that of the consumers, or if the shares pass out of the hands of the consumers, the theory fails. I can give you a remarkable instance of that in the metropolis at this moment. A company over the water started years ago, called the Surrey Consumers Company, and they got their shares taken to a large extent by consumers, but they have sold out, and there are very few left; and when they were in Parliament two or three years ago they attempted to alter the name, but Lord Redesdale said "No; you must keep your original title."

Thomas Hawksley, Esq., examined by Mr. HOPE SCOTT.

I have been engaged as a gas engineer for about 30 years, and I have appeared in these committee-rooms in connexion with very many of the gas companies in this kingdom. I am able to give their lordships an opinion as to the state of the Hibernian Company's works, and the quality of the gas which they distribute to the public. The works are at present in an improving condition. There is no doubt that a few years ago they were considerably dilapidated; they have been very much renovated, and they want only now a moderate sum laid out on them to make them perfect. The alterations are in progress, but they are not completed. When they are completed, in my opinion, the works will be adequate to any reasonable calls that may be made on the company. The whole of the works at Dublin, Bray, and Monkstown will be capable of producing 3 million cubic feet per day; without stress at all they will produce 2½ or 2¾ millions. They have holders which will enable that quantity of gas to be distributed. They have at Dublin holders capable of containing 1,600,000 feet of gas, and that enables 2,400,000 to be distributed.

A LORD: That is to say in the pipes and holders.

Witness: Yes; the gas is being made while the holders are contributing their contents, therefore we find, as a general rule, in places like Dublin, that the distribution may, without any difficulty, extend to one-half more than the cubical contents of the gasholders. They have other gasholders at Bray and Monkstown.

Mr. HOPE SCOTT: Is that an adequate amount for the demand in those places?

Witness: Yes; at Dublin the consumption has only reached 1,600,000 feet as yet. The illuminating power when I was there was about 15½ candles; but I have a note. I remarked in the note that it was high. That was when I was there last time. I have been perhaps four or five times in these gentlemen's works altogether. I have this distinct note, and it is underlined, that at the time I was there they happened to be manufacturing from Kirkless Hall coal, and I made a remark "Fresh in." It is only owing to the circumstance that they were then manufacturing from fresh Kirkless Hall coal that we got that high illuminating power. I have a note at the same time that the average of the company's own observations was about 13¾ candles, whilst we find 15½ on that particular occasion. With respect to purity, the gas was quite free from sulphuretted hydrogen, and very nearly free from ammonia. There was a trace of ammonia in it. The purifying was by lime, in the ordinary way. All gas is better for having a small quantity of ammonia in it, but not a large quantity. As regards cannel coal, I should not recommend the company to use cannel coal to any extent. They could not do it without ruin, and both companies must concur in it, for what one company does the other company must do. They could not supply in Dublin cannel coal gas at the price at which they are now selling their gas.

Cross-examined by Mr. O'MALLEY: I should not be surprised to find that, of the two companies now in Dublin, they are not both supplying gas of the same illuminating power; but at the same time it must be very nearly the same. They may, perhaps, buy their coal at different pits. I should be surprised to find that generally there was as much difference as 2 candles; I should think occasionally it must be the case. It is easy to account for 1 candle. The last time I was at the works was on the 24th of April, and I was there the previous week; and I was there some years ago several times. I was concerned for the company when they were before Parliament as petitioners on the Cork bill, which I think was about seven or eight years ago.

Mr. O'MALLEY: You made a remark that they had fresh coal in.

Witness: The way in which it was done was this: I was struck with the high illuminating power of the gas. I inquired what coal they were using, and under what circumstances it was used; and I also asked (and I had free admission to it) to be allowed to look at their own book of photometrical observations. I found there was about 1¾ candle higher value in gas at the time I examined it than was the average result of all the observations which the company had made. I have ascertained the conditions of carbonization, and I find what I have related to their lordships. I have no doubt it was accidental.

Mr. O'MALLEY: You said you found they had been getting in some sort of coal, and that it was quite fresh?

Witness: I said it was "fresh in."

Mr. O'MALLEY: Was it brought in on that day?

Witness: No; it was quite a recent importation.

Mr. O'MALLEY: How long would the influence of that freshness last?

Witness: They sometimes buy coal in summer, and store it for winter.

Mr. O'MALLEY: You would be surprised to find that the fresh coal failed in its efficacy by next day?

Witness: Yes. As a gas engineer, these undulations in the illuminating power are quite familiar to me. I know that they arise accidentally sometimes.

Mr. O'MALLEY: And, therefore, an engineer going down merely to look at it for one day is not a very satisfactory piece of evidence, is it?

Witness: No, unless he knows the conditions under which the gas is manufactured, and which any cautious engineer would do. There are works of renovation now going on, beyond the ordinary repairs. They are proceeding to put up a new retort-house, and I should be surprised to hear any one say that no works of reconstruction have taken place since Mr. Ronald went. The population of Dublin within the company's area is, I suppose, more than 300,000. For a town or city like Dublin the usual maximum consumption is about 10 cubic feet per head per day. In manufacturing towns, such as Nottingham, it gets up to 14 cubic feet per head; in most manufacturing towns it is about 12; in towns which are non-manufacturing, but where there is not so much display light as at Dublin, it is about 8; but at Dublin I should take it to be about 10 cubic feet. With respect to the purity of the gas and its effects upon the fittings and burners, if they are copper, and there is ammonia, the ammonia enters into combination with the copper and corrodes it. With regard to sulphur compounds, they do not produce so much effect. As a general principle, it is not much maintained that the impurity of gas is shown very much in its effects in the fittings and the burners, except as regards the ammonia. You will see streaks of green colour wherever there is brass or copper. It is the action of the gas and heat which corrodes the fittings and the burners.

Cross-examined by Mr. BARRY: The principal effect produced on fittings is by the ammonia. That produces the green stain which is so generally seen where there is brass or copper. With respect to the clotting or choking, that is a little deposit of carbonaceous matter—it may be dust. With respect

to the loss of illuminating power at 1000 yards from the works, that depends very much on the weather. It is a question of condensation.

Cross-examined by Mr. STEPHENS: I know of only two companies which have had to close an equal number of stations—this company, and the British Gas Company.

Mr. STEPHENS: Must not this company have been very unfortunate, or have had very bad management?

Witness: In early years, perhaps, there may have been a little of both; but I believe the difficulty of this company has been occasioned by the fact that they have been strangers—what they call in Ireland, Saxons. I think they have taken steps to overcome this prejudice, but I do not know that they have succeeded very well. That is quite another thing. With respect to there being no board of directors in Dublin, and only a small portion of the capital there, I think nothing of that. Half the continent is supplied with gas that is furnished from money found in London, and the board situate in London. It is the same in Belfast; they were unable to make a company of their own, and one was formed at Leicester, and nearly all the shares of that very large undertaking are held at Leicester—that is, because the people will not help themselves; and they complain afterwards that they are helped by others.

Mr. STEPHENS: There is the Alliance Company already on the spot.

Witness: Then you see this company exists despite the existence of the Alliance, and does the larger business of the two.

Mr. STEPHENS: And gives satisfaction.

Witness: I cannot say a great deal about that, but they sell their gas, and if they did not give satisfaction they would not do that.

Mr. *William Innes*, examined by Mr. HOPE SCOTT.

I am chief engineer in London of the Phœnix Company. I have examined the works of the United General Gas Company, at Dublin. I have heard the evidence which has been given by Mr. Barlow and Mr. Hawksley, and I concur in what they have said as to the capacity of the gas, and the improvements in progress, and the present condition of the plant altogether. I do not, however, quite concur in what has been said with respect to the quality of the gas, for I found it 13¾ at the works, and 14½ at the office in Lombard Street. Compared with the London gas it was of good quality, and must of necessity almost be the same, because it is the same coal that I use myself, and the same class of cannel, and the mode of production the same. The mode of purifying was not quite the same. They had their improvements in progress; they had better condensation than in previous years, and also better means of getting rid of the ammonia; more extensive scrubbing and washing. They had also additional dry-lime purifiers, and wet lime; so that they were considerably improved over what they were in former years.

Cross-examined by Mr. NORWOOD: The date of my visit was the 11th of March. I had not previously visited the works, but I could see the evidences of recent alterations, particularly applying to the manufacture. I could see the evidence where iron retorts had existed, and clay ones been substituted, and where improved exhausters were in use.

Cross-examined by Mr. BARRY: The price of coal is about 2s. 6d. a ton more in Dublin than in London, which arises solely from the difference in freight.

Mr. BARRY: What difference in the price of gas ought 2s. 6d. in a ton of coals to make?

Witness: Threepence a 1000 would be a reasonable increase.

Cross-examined by Mr. STEPHENS: Coals coming into London pay a tax of 1s. 1d. a ton. I should think that the city of Dublin would charge an import duty, or some sort of charge.

Dr. *Letheby*, examined by Mr. HOPE SCOTT.

I am professor of chemistry at the London Hospital, and gas analyst to the City of London. I have held the appointment 12 years. It is my duty to examine and analyze the gas so as to protect the public. I have been largely concerned in parliamentary inquiries on the subject of gas. I was one of the principal chemical witnesses in 1861, when the Metropolis Gas Act passed. On the 8th of February last I visited Dublin, for the purpose of examining the quality of the gas supplied to the city by the Hibernian Company. My examination extended over two days; I took my own instruments with me. I examined the gas in four places. I examined it at the office in Foster Place, and I found the illuminating power there to be 14·07 sperm candles, standard quality; and on another occasion I found it 13·42, and the next 14·59 at Foster Place. I tested it at Lombard Street, and I found it there 14·71 candles; I tested it at the works, and I found it there 14·21 candles; and I tested it at Kingstown, at the works there, and there it was 13·35 candles. The average is this, that in Dublin the power of the gas is equal to 14·33 sperm candles, and at Kingstown it is 13·35. It is two candles better than the standard of the Gas Act, but the gas in the City of London is now very nearly at its power, being between 13 and 14 at the present time. With respect to the chemical quality of the Hibernian Company's gas, I tested it for ammonia, for sulphuretted hydrogen, and for sulphur; it contains a trace of ammonia, the actual quantity is 2·12 grains per 100 cubic feet. I tested it for sulphur, it contains 17·92 grains of 100 feet, and it did not contain a trace of sulphuretted hydrogen.

A LORD: Are these proportions of sulphur and ammonia injurious?

Witness: The proportion of ammonia is very small; the proportion of sulphur permitted in the London gas is 20 grains. I find it $2\frac{1}{10}$ grains less.

Examination continued: Speaking from my experience, and having reference to London, I should say that the gas supplied by the company in London is very good. I also inquired as to the pressure, and found that it ranged from $2\frac{7}{10}$ inches to $2\frac{8}{10}$ inches. That was in the day-time. That is rather a large state of pressure.

Cross-examined by Mr. NORWOOD: I should not be surprised to learn that, from the 8th of February till Mr. Hawksley's visit, the gas of this company never reached the same illuminating power. I should like to know what the range was in the interval. I say it was 14 when I visited it; and if it had been 13 in the interval there would be nothing surprising about that. At the time I was there, the works were undergoing, to a certain extent, improvements; but I did not see anything unsatisfactory in the condition of the works, looking at it, not from an engineering point of view, but scientifically. They had adopted very perfect plans of purification, and their process of carbonization seemed to me to be very good. I dare say there is a difference of opinion amongst gas engineers, but I think that the processes at the works were good and satisfactory processes, and did effectually purify the gas.

Cross-examined by Mr. BARRY: My experience in London is that, at the distance of 1000 yards, the 12-candle gas loses about 1½ candle in the average. In 1860, the burner with a small aperture was not generally used by the public; here and there it was used for photometric experiments. It was not then regarded as the usual test-burner; in fact, there was no usual test-burner at that time.

Cross-examined by Mr. STEPHENS: With respect to the system of giving notice to a company before going to their works, where the testings are carried on constantly, and where there is a tester appointed by the corporation, whose duty it is to test the gas every night, there is no necessity for notice; but when there is a tester appointed now and then, I think it would be fair that the company should have notice, and then an officer of the company should be present at the testing.

Mr. STEPHENS: With regard to the modern gas Acts, you usually feel it right to insist on four points: the minimum illuminating power, the indication of ammonia, freedom from sulphur in any form, and freedom from sulphuretted hydrogen.

Witness: I have given evidence to that effect.

Mr. STEPHENS: Do you find in this bill such provisions, in all these respects, as you approve?

Witness: I cannot tell you.

Mr. STEPHENS: If I tell you that it is deficient in three of these points, will it meet with your approval?

Witness: I should like to see what the clauses in the bill state.

Mr. STEPHENS: It has been stated that there are no clauses, such as those contained in the London bills, to indicate the ammonia, the sulphur, and the sulphuretted hydrogen. Omitting these, would the bill meet with your approval?

Witness: It would be as well to provide for those impurities. If it was not provided for I should say the bill to that extent was deficient.

A LORD: The Metropolis Gas Act provides that there shall not be more than a certain quantity of sulphur in any form, that the proportion of ammonia shall not be so large as to stain the chemical paper, and that it shall not contain sulphuretted hydrogen.

Re-examined by Mr. BURKE: At first the test required by the Metropolis Gas Act as to the quantity of sulphur and ammonia permitted to be in the gas was not found to work well by experiment, but at the present time they are managing so as to keep the proportion of sulphur within the proper quantity. With respect to the notice, I think it is undoubtedly fair that if a company is subjected to a penalty for not supplying gas of a particular quality that they should have notice of the experiment to ascertain what the quality is. I know that every question was considered before a select committee of the House on the Metropolis bill, and they thought it fair to the companies that they should have notice.

Mr. BURKE said that this was his case.

The counsel and parties were here ordered to withdraw. After a short time they were called in, and the chairman said that the committee were ready to hear Mr. O'Malley in opposition to the bill.

Mr. O'MALLEY then addressed their lordships against the preamble of the bill on behalf of the inhabitants of the city of Dublin. He said that the petitioners had not gone to the same expense about witnesses as the company were able to do, but at the same time he should avail himself, as far as he could, of the witnesses who were present, and who would, he thought, establish his case effectually before their lordships. He ventured to say that their lordships had never had a bill of this kind before them on any previous occasion—he ventured to say no committee of this House or of the other House had ever had a bill of this anomalous description before them. His learned friend, in opening the case, likened the company to some other companies—for instance, the British Gas Company amongst others; but then that was a totally different case, for, though the British Gas Company might have its head quarters in London, yet every one of its bills and its branches were in themselves complete and isolated, and had no dependence or connexion whatever with the original company, further than that, when the original company had taken its amount of profits, they might divide the remainder among themselves in any way they pleased. It was necessary that he should draw their lordships attention to the position which this company occupied. It was established a great many years ago for the purpose of supplying gas in various towns—indeed, in any town they pleased in England, Ireland, or Scotland. It appeared from the evidence which had been given that they had, in point of fact, established companies in various places. What number of attempts they made to establish companies in other places the committee were not aware of. But they had the fact that they had established companies by a system, and that a system of waste and recklessness which characterized companies of this description in the purchase of the goodwill and *locus standi* of other companies in different parts of the kingdom; and they came before the committee representing that, after all these transactions which they had carried on in many different places, that of their capital, which amounted originally to £450,000, there was £366,000 still surviving for the benefit of the city of Dublin. It was monstrous to suppose that a company which had been carrying on, by its own confession, losing transactions (whether Limerick was a losing transaction he did not know) since 1825 or 1826, when it was first established, that this capital had so little diminished and suffered by these transactions that now they had available the sum of £360,000. That was about as strong a proposition as ever was made; and if it was possible to suppose that this bill would ever come before their lordships in such a shape as would render it necessary to inquire into all these things, he apprehended they would require more evidence of the real accounts of the monetary proceedings of the company than they had yet received before they would charge upon the city of Dublin the belief that there was £360,000 of that capital represented in that city. The only evidence to prove these facts had been the evidence of a gentleman, the secretary of the company, who really, he must say, knew nothing about the proceedings, because he was obliged to go into the witness-box on the second day after his long previous preparation, and contradict, and recall, and recant almost everything he had said about the monetary transactions of this company. And yet that was the only witness the promoters produced in order to satisfy the committee of the state of their accounts through these many long years. It would be necessary just to look at what the proceedings of this company had really been. They had purchased themselves into Plymouth, but afterwards they sold themselves out of Plymouth. They said that they paid the losses out of profits. Possibly, if these accounts were investigated in a proper manner, it would be found that the money which they say was bought out of profits was lost out of the £60,000 which they sought to capitalize against Dublin. The second witness proved that all that remained available was worth about £1000; and that was, in point of fact, all which represented, for the benefit of the city of Dublin, the outlay of £140,000 which they made for the purchase of goodwill. If a company went on in this reckless way, flinging away their money in such a style as that, in buying up other companies and endeavouring to establish monopolies, they certainly ought to bear the burden themselves, and ought not to turn round and attempt to throw the loss of their improvident purchases upon the public consumers; for the gas companies had never been treated by the Legislature in the light of mere commercial companies. Commercial companies were those which carried on business owing nothing to Parliament but the general protection of the laws. Gas companies and water companies, but especially gas companies, were companies which came to Parliament for the powers

which they possessed, looking to those powers to make their capital avail able for large profits, and they came to Parliament for the purpose of esta blishing what was abhorred in every other branch of business—namely, a monopoly; for as soon as they get an Act of Parliament which enables them to open up the streets, they did essentially at once and practically obtain a monopoly. Some question was made on this in the early part of the discussion, but he apprehended that the law was perfectly clear. No matter what power was vested in public bodies, in paving commissioners, or trustees of public bodies, even though the soil and freehold of the road was vested in them (which was very rarely the case), yet they could not, when once they had dedicated that land to the public use to be used as a road or street—they could not give any man, or body of men, the power to break up the road, for it would enable them to commit a nuisance. So with telegraph companies, in the case of which there had been three indictments in three counties. He himself was concerned in one, in which a judgment was given; and although the telegraph company had armed itself with the permission of all public authorities and trustees of the road along the side of which they put up telegraph posts, and through the whole extent of which its wires went, yet an individual (Baron Rothschild) indicted them for a nuisance for putting up their posts on the public road. In that case a judgment was given by Baron Martin, in which he laid down the law that no body of men could give another body of men or an individual a right to do that which the law looked upon as a nuisance, and the placing of any posts or sticks upon any part of the street or the road, even though it occasions no inconvenience to the public, was a nuisance and the subject of an indictment. An appeal was made to the Court of Queen's Bench, and they gave their deliberate judgment confirming the view taken by Mr. Baron Martin.

The CHAIRMAN: When was the decision of the Court of Queen's Bench?

Mr. O'MALLEY: The year before last. No doubt many corporations were invested by Parliament with the right of establishing gas and water works for themselves, and also of giving permission to other bodies to break up the streets whom they employed for the purpose of lighting. He did not say that this applied to the corporation of Dublin, for there, he understood, the soil of the streets was vested by law in the corporation.

The CHAIRMAN: This does not apply to Dublin.

Mr. O'MALLEY: There was another case, where the law had gone still further, showing the necessity for an Act of Parliament; for in many places in the west end of London, he believed, if not in the City, it was held that to the middle of the road the freehold belonged to the owner of the adjacent house, and though the Paving Commissioners had a right to deal with the road for the purpose of repairing and making it fit for the public to go over, they could not give a right to any body to carry pipes through, or anything which went under the soil of the road.

The CHAIRMAN: But if the soil is vested in the corporation?

Mr. O'MALLEY: If they could take the pipes and shoot them through, without breaking up the public streets, they could do it; but if the soil was vested in their lordships, they could not break it up. If there was a public road leading through their lordships park, their lordships could not authorize any body to break up that road.

The CHAIRMAN: That has never been held in late decisions.

Mr. O'MALLEY: It was held in the case of the Sheffield Gas Company.

The CHAIRMAN: Not even the concurrence of the corporation and of the lord of the soil together could do it?

Mr. O'MALLEY: No.

The CHAIRMAN: The surface of the street is for the public?

Mr. O'MALLEY: Certainly; and it could not be disturbed. If Parliament gave to a body a right of breaking up the streets, of course then they legalized it; and if they gave a corporation the right to break it up, they legalized it; but unless Parliament gave them these powers it was illegal.

The CHAIRMAN: In the case of the metropolitan sewage, were there special powers given?

Mr. O'MALLEY said there were special powers given to the Drainage Commissioners; it was a power given by Statute by the general law of sewage. The Commissioners of Sewers had great powers, not only to make sewers, but also to compel others to make them.

The CHAIRMAN: Then in that case they can give others authority?

Mr. O'MALLEY said he did not know whether they could give authority to others, but they could make them themselves. In point of fact, these gas bills had swarmed in consequence of this decision in Sheffield, because the people supposed that this power could be given; but, like many other rights, when once it came to be tested, it was found that it did not exist. Then they all began to come to Parliament. But the effect of one company getting parliamentary power to break open the streets, and another company not having parliamentary powers to break open the streets, was, that one could turn the other out of the whole district. And with respect to one small district, to which he would call their attention by-and-by, and which he represented in this committee—he alluded to Dundrum, which was well and sufficiently lighted by a company which had been established there for years—if this bill was to pass, this company, which had not a stick in the place, and had no name, could turn out the Dundrum people, because they would have powers to break up the streets, which the Dundrum company had not. Their lordships had heard a good deal, but they would hear a good deal more. They had heard some echo of the complaints which were urged against this company which was now before the committee, and he (Mr. O'Malley) would, he thought, be able to prove very satisfactorily that this company had been doing everything they could to make themselves unpopular in Dublin. He disagreed with his friend, Mr. Hawksley, who was as ingenious in his law and in his politics, as he was in his engineering, when he said that the losses and misfortunes of the United Gas Company had arisen from the fact of their being looked upon as Saxons in the city of Dublin. If it was not for the profound respect which he entertained for the modesty of Mr. Hawksley, he could almost have said it was effrontery for him in the presence of this committee to say that the losses and almost the ruin of the Dublin Company was owing to the fact that they were Saxons. But whether the company were Saxons or Celts, there was one thing which gave undoubted dissatisfaction to the people of Dublin, and that was that they should be handed over to the dominion of a company, scarcely one member of which ever set foot in the city, and the directors of which could not be met in streets and personally remonstrated with as to the way in which they fulfilled their trust. He contended that it would be a disgrace to the city of Dublin if they did not murmur and exhibit discontent at such a state of things. What was the evidence of their own surveyor? Why that, when the officer of health called at the works for the purpose of making a complaint as to the injurious effects of their works upon the sanitary condition of the town, the answer of the surveyor was—"I will refer it to the board in London;" so that, although gentlemen had come forward and stated to the committee that everything had been done to meet the wishes of the inhabitants of Dublin, yet, forsooth, no money could be spent till a reference was made to the board in London. This was, undoubtedly, a just cause of complaint, and he trusted the committee would be of opinion that a large city like Dublin ought to have its local government (for the administration of the light was part of the local government) situated within its own limits. Gas had become almost as great a necessary of life as air and water, and the persons who administered that ought to be resident in the city, ready to hear all complaints, and to see and test the reports of their one or two paid officers. One of the witnesses had talked greatly of the liberality of the company in repairing all fittings which had been complained of by the consumers. His friend, Mr. Barry, had elicited that these dilapidations in the fittings were due, not to anything wrong in the fittings themselves, or to ill-treatment on the part of occupiers of houses, but to the bad quality of the gas, which corroded the fittings and wore them out more rapidly than they otherwise would be. Of course liberality was mere moonshine in such cases as these, and the grounds which he had already laid before their lordships seemed to him sufficient for disposing of this bill. But there was another fact to which he would call their lordships attention, which stamped this as an extraordinary bill, and unlike any which he had seen before. Their lordships were obliged to take two bills almost in hand. There was first of all the bill itself, and he would just call attention to the nature of that bill. But, before he referred to this, there was just one other point to which he would refer. He had already called attention to the enormous price at which the goodwill of these various companies had been purchased up. So long ago as the year 1847, a consumers company (he believed the present Alliance Company) was started, and under an Act of Parliament passed in 1846 a commission was issued to certain gentlemen for the purpose of making certain inquiries with respect to the grounds for forming a new company. The report of that commission was now before their lordships, and certainly anything more damaging than the report which they gave of this United Gas Company could scarcely be conceived.

The CHAIRMAN: What report is it?

Mr. O'MALLEY replied that it was the report of a commission composed of three gentlemen—two civil engineers and a Queen's counsel—and in their report these gentlemen stated that the Hibernian Gas Company's works were old, constructed upon no uniform plan, and subject to all the inconveniences arising from works added to piecemeal. The commission also called attention to the fact (and this was very important when another portion of the case came to be considered) that the company also contracted with the Dublin and Kingstown Railway for the supply of coke, and it was admitted by the assistant-engineer in evidence that the reason why the company used so much South Wales coal was to get coke hard enough for railway use. The commission expressed their opinion that to make good coke was incompatible with good gas making, and yet it appeared, from the cross-examination of his friend, Mr. Barry, that this practice, which was complained of by the commissioners in 1847, had been continued down to this very hour by this company. The commissioners also expressed their opinion that a large proportion of the then existing mains were of little or no value for the gas in Dublin. That was the state of the company so long ago as 1847, and he should be able to show that no attempt at real improvements had been made from that time up to the present. They had made renewals of portions of their works—renewals which they sought now to charge against the public, but which Mr. Hawksley, with his large experience, said they had no right to charge upon capital. The fact was, the company had bought paper works, if he might so call them—mere gingerbread works—to be abandoned and rebuilt at the expense of the people of Dublin. He would now proceed to call their lordships attention to the bill itself. The preamble first recited the charter of the United General Gas Company; and he would here remark, that so ill-prepared did the company come to Parliament, that it was with the greatest difficulty that it was possible to ascertain what amount of capital was paid up, and what amount they were now about to fix as the capital of the company. He thoroughly believed that the company did not now know what their original intention with respect to it was. In their patent they were authorized to raise £500,000; then was recited the incorporation of the company, and the purchase of the various other companies; and then it went on to say—"And whereas the Dublin Gaslight Company and the Dublin Oil Gaslight Company, otherwise the Dublin New Gas and Coke Company, have been for many years in abeyance, and the powers contained in their respective Acts have ceased to be exercised."

The CHAIRMAN: It may save time if I say that the committee will in no case pass the bill, allowing the capital expended in Dublin to exceed £315,000. I do not know whether that will make any alteration in the promoters going on with the bill. That is, we propose to substitute £315,000 for the £425,000.

Mr. BURKE said he was not prepared to give an answer at present.

Mr. O'MALLEY said he would now call their lordships attention to another portion of this case, which was really most monstrous. He would say nothing more about the capital at present, but would proceed with the Act. It went on—"And whereas the company have constructed gas-works in the city of Dublin," and so on, and then proceeded to recite the incorporation of the general Acts, and one or two more, till it came to the 4th clause, which was as follows:—"The several before-mentioned Acts of the 1st George IV., c. 55; 4th George IV., c. 99; 4th George IV., c. 38; 10th George IV., c. 52; 5th George IV., c. 42; 5th William IV., c. 42, shall be, and the same are hereby repealed." Then, having got so far in the Act, it was necessary to recur to the amendment clauses, and then came in this extraordinary part—"The said letters patent shall be and the same are hereby repealed." So there went the letters patent.

The CHAIRMAN: Is there not a reservation at the end of the clause?

Mr. O'MALLEY said he would call attention to that presently. It continued—"But, notwithstanding such repeal, the company shall continue incorporated by the name or style of the United General Gaslight Company, with perpetual succession and a common seal, with full power within the limits of this Act to purchase, take, or lease, or rent, and hold, and sell lands, subject to the provisions of this Act." Why, what were they doing with these letters patent? They were doing that which could not be done according to constitutional proceedings; they could not annul these in part, they must be annulled in whole. The letters patent were repealed; but then a sort of vitality is given to the company by continuing it as a sort of corporation—a sort of vitality given to the works at Limerick. And this was the Act of Parliament of which notice was given with respect to Dublin, but of which the people of Limerick had no notice at all. This Act of Parliament was incorporating the company for carrying on works in Limerick as well as in Dublin, so that every creditor who had a demand against the company in respect to any debt incurred in Limerick, might, if he got judgment against the company, levy the amount of the debt on the company's property, and leave the property at Limerick untouched. It then continued—"And notwithstanding such repeal, the company shall continue to have

the right to hold, possess, enlarge, acquire, and enjoy their existing gas and other works and property at Limerick and the neighbourhood thereof, and all rights, powers, privileges, and easements connected therewith or relating thereto, in the same manner and to the same extent as if the several portions of the letters patent set forth in the schedule to this Act had not been repealed; and the said several portions shall be deemed to be still in force for the purpose of the said existing works, and property, rights, powers, privileges, and easements." He conceived that they would have to remodel their Act of Parliament, before they could expect it to be passed by their lordships. It would be remembered that when he suggested to Mr. Gregory that in case of defalcation in Limerick it could be paid out of the money in Dublin, Mr. Gregory replied that they had not the money to lay out. No doubt, out of the £450,000 which was said to be paid up, except their floating capital, and what was represented by their works, not one shilling remained.

The CHAIRMAN: They said there was £6000.

Mr. O'MALLEY said that was no doubt what they required for present disbursements—a drawing balance at their bankers. By-and-by, no doubt, they would want to lay out money in Limerick, and plenty of men would be found ready to do their work for them, knowing that in case of non-payment they could come to Dublin and seize the whole work and plant of the company there.

The CHAIRMAN remarked that the reason the committee had fixed on the £315,000 was because they considered that amount still in existence.

SATURDAY, MAY 27.

Mr. O'MALLEY continued his speech in opposition to the preamble of the bill. He said that in his statement on the previous day there was one question put by the committee which he answered incorrectly, and he wished to correct it as soon as possible. When he was speaking of the powers of the Dublin Corporation, he was not aware that in the Act of Parliament which passed in the 12th and 13th Vic., there was a clause to the effect that the clause of the Gas-Works Clauses Act of 1847, with respect to the breaking up the streets for the purpose of laying pipes, should be incorporated with that Act, so that within limits of this Act of Parliament the corporation could give a company power within their district of breaking up the streets. The district over which the company asked for power extended a distance of 16 miles from the extremity of the parish of Finglas to Bray. For this district the company sought to obtain parliamentary powers, which, if once conferred, would operate to give this company a monopoly, and the power of turning other companies out of the district, except within a small portion of it. Their lordships had already heard from one of their own witnesses that whilst they were laying their hands on that enormous district, they had no intention of lighting it at all. What they wanted there was by anticipation to get powers which would give them a *locus standi*, and enable them to bar any other local or other company which might be established for the purpose of supplying those places with gas. He would briefly call their lordships attention to the way in which the company secured to themselves a monopoly of the corporation power; for, when they entered into contract with the corporation of that day for the supply of gas to the public streets, they accompanied it with an agreement on the part of the corporation not to exercise the power given them by that Act of Parliament in favour of any other person or company during 20 years, expiring in the year 1865, for which their contract lasted. So that they made a perfect monopoly within the limits of the corporation district by binding the corporation not to exercise their parliamentary powers in favour of any other company whatever; and, as the commissioners who sat upon this inquiry said, they purchased that monopoly at the expense of the private consumers of the city of Dublin; for, while they were getting for the lamps which they furnished to the public a price which would bring in 2s. 4½d. per 1060 cubic feet, yet they were charging the private consumer at the rate of 7s. 6d. per 1000 cubic feet. So they were charging them more than three times as much as for the public lamps, and that was done for the purpose of buying up and securing a monopoly. That was another example of the extraordinary means which they had resorted to in buying up other companies at exorbitant prices, and securing to themselves a monopoly in the city of Dublin which they never would have acquired by any mercantile energy. Their lordships had already had before them abundant evidence to show how grossly (he did not use too strong a word) they had abused that monopoly which they had thus acquired. Witnesses would be called who would show that the supply of gas was in many instances deficient, and that the quality of the gas was in many cases abominable—that persons sitting with the light close above their desks could not read by it; that complaints were made, but were utterly unattended to, the usual answer being—"We will refer it to the board," and that distant board paid no attention to those complaints. One of their witnesses, Mr. Sanders, who was called, said that the book of complaints, in which he would not undertake to say all the complaints were entered, contained from 3000 to 4000 complaints in one year. Some of these, no doubt, were trivial complaints. He had no doubt to the eyes of a gentleman like his learned friend on the left (Mr. Burke), who rejoiced in the lucrative position of director in great gas companies, and whose heart and mind was burned in the notion of the benefits of monopoly, no doubt to them those complaints would appear trifling complaints—frivolous complaints. Everything which disturbed the equanimity of a well-paid official was a frivolous complaint; but those complaints amounted to 3000 or 4000 a year, and the witness had the coolness to say, "for the most part they concerned the state of the fittings." Well, the state of the fittings, it turned out, were in the main probably produced by the bad quality of the gas, and those were complaints which proved, even taking it according to the interpretation of those gentlemen, the way in which the company had abused its trust. The people of Dublin had bad gas, and yet they had been paying more than any other town of like description in the kingdom, and it was only when competition was rising that the company ever lowered their prices at all; and had it not been for the efforts made at competition from time to time, there never would have been any reduction at all. Such being the state of affairs, his learned friend, Mr. Burke, said, "Oh, let bygones be bygones."

Mr. BURKE: When did I say that?

Mr. O'MALLEY said those might not be the words used, but that was the spirit of them, and the company now said, in effect, "We have made the virtuous resolve of coming now to Parliament for the purpose of getting our vicious propensities restrained, and ask you to bind us by Act of Parliament to behave well for the future. We are putting ourselves under the Act of 1847." Why the Act of 1847 was in many respects of no avail, and restrictions which advancing time had shown to be necessary had from time to time been inserted in private and public Acts. The company also said they were going to put themselves under modern improvements, and he ventured to say that the notion collected by their lordships as to the nature of these improvements was that they were embodied in the Metropolis Gas Act of 1860. But even that Act was now almost superseded in many of its provisions. No one thought of 12-candle gas now, but that was the standard appointed by the Metropolis Gas Act; besides which, the plan of photometrical measurement was such as would enable any company in the kingdom to change the whole character of the gas before the parties came to measure it. If the company really desired to come under modern improvements, why did they not come to Parliament before? Why did they endure the withering condemnation of the commission of 1847, and not come to Parliament to amend their provisions? There was that clear and emphatic declaration with respect to the carrying on the inconsistent trade of coke sellers to a railway company and gas sellers to the public; why did they not take means to rectify that which they could have done without coming to Parliament? They had never shown the slightest indication of a desire to correct a single abuse, except when urged to it by the starting up of opposition. All improvement which had taken place was due to threatened opposition, and now, when they came at this present time, it was because another company was in the field. Public remonstrances from the Board of Health, from the corporation of Dublin, and from the public were all alike disregarded; and not till another company, already in existence, was trying, with the suffrages of all the principal inhabitants of Dublin, to extend itself, did this company come to Parliament. The exact dates of their notices could not be ascertained, but every one who had experience in these matters must know that those notices were only given for protection, and in order that they might have a bill before Parliament at the same time that the other company were coming for a bill. No one complained of that. He believed it would have been the desire of the inhabitants, and he believed also of the corporation—though, perhaps, he had no right to speak for the corporation, who were so ably represented by his friend, Mr. Barry—but he believed the corporation and the inhabitants would have been satisfied if the two companies could have came before Parliament together, and have laid their claims and proposals and clauses before Parliament together, and have left it to a committee of the House to decide between the two, as to which was the most calculated to do justice to the inhabitants and gas consumers of Dublin. And with a view to allowing that course to be taken, and the judgment of Parliament upon the proposals of both companies obtained, he understood (though perhaps that was a matter for his learned friend, more than for himself to refer to), that the corporation renewed their contract only for a year, though it compelled them to pay a higher price, in order that the field might be left open till Parliament had decided between the companies. The other company, as they had heard, was defeated on Standing Orders, there being some technical variance between the notices for the bill and the bill itself; and certainly it did seem strange that this company, never having given any notice of their intention to deal with Limerick at all, should have been allowed to pass through Standing Orders in the way they had done. However, so it was, and now this company was desirous of just getting the start of the other company, and for that purpose they were ready to endure anything which might be put upon them. Their lordships had cut down their capital, but they assented to that; and if the committee dealt with the bill in any other way they would accept it, for all they wanted was to get something upon which they could stand next session as a parliamentary contract, and use for the purpose of defeating another company. Something which would enable them to say, "Parliament has given us a bill and associated and incorporated us for the purpose of carrying on the works, and without giving us a trial are you going to let another company in?" With respect to these provisions which they proposed to introduce, he would call their lordships attention to the utterly illusory nature of them, so far as regarded the city of Dublin. It was true that many of the objections might, after laborious investigation on the part of the committee, be altered, but there were some of them which he ventured to say could never be altered; and his learned friend, in anticipation of the immense amount of manipulation the bill would require before it could be put into shape, said the bill was not what it was now, but what it would be when it came out of their lordships tribunal. But that was not a fair way of putting it; they should come with their own proposals fully matured. Their lordships would see that there was no restriction in the bill as to the manner in which the money raised by the debentures was to be applied. The debenture money might be raised upon the security of the property and works in Dublin, but there was nothing at all to provide that it should be expended upon the works in Dublin, or for the purpose of Dublin at all. It was a remarkable piece of evidence, taken in connexion with this observation which he had been making, in which the engineer of the company told their lordships that the works were now in a state fully to answer all requirements, and even more so.

The CHAIRMAN: It is still more contradictory; it says "The company may from time to time expend upon their gas-work within the limits of this Act, either by improvements in extending such works, or in such other manner in connexion therewith as they may deem expedient, all or any part of the sum of £50,000 which they are authorized to raise by shares, and also any money which they may raise by way of loan or debenture stock on the provision of this Act." Has that any limit?

Mr. O'MALLEY: No.

Mr. BURKE said that these were objections in the clauses whilst their lordships were now dealing with the question of preamble.

The CHAIRMAN: You would be prepared to alter it?

Mr. BURKE said there was another clause stating what was the amount of capital applicable to the city of Dublin, and other clauses stating that the company should publish their accounts of actual expenditure.

The CHAIRMAN: You and Mr. O'Malley are agreed that the £50,000 raised from additional shares must be spent in Dublin?

Mr. GREGORY said the bill was certainly formed with that view.

Mr. O'MALLEY said he did not care with what view the bill was formed. As he said before, a great many of those things might, no doubt, be altered, if they were dealt with individually; but the aggregate of them was so great, and the alterations required so enormous, that the committee would have full grounds for postponing the bill until an opportunity was given to the promoters to rearrange that bill, and bring it in proper shape before Parliament. Their engineer had stated that the works were fully adequate for the supply of a much larger amount of gas for Dublin, Kingstown, and Bray; and also that, in the event of the works requiring to be enlarged, there was sufficient land to enable them to be doubled, both at Dublin and Kingstown; and if that was correct, and also the statement of Mr. Hawksley, that the works of repair and reconstruction ought to be charged, not upon the capital but upon the income, it followed that the company did not want one farthing of additional capital at all. By the wording of the Act, express power was given to the company to apply the additional share

capital of £50,000 to renovations, and to those things which ought to come out of income. Nay, more, they might apply every portion of that to the floating capital in Dublin; they might realize that floating capital, and leave them free to use it elsewhere. They admitted, as he pointed out to their lordships the previous day, that, with the exception of the floating capital, they had no money to use in Limerick, and that the more strictly their lordships confined the company to the purpose of Dublin, the more absolutely they were plundering the city of Limerick and the gas consumers there; and there was not a consumer in Limerick, or a public body, that would not have a right to petition the House against this bill, as a bill which was applying specifically to the Dublin funds, which at present belonged as much to Limerick as to Dublin. With respect to dividend, the company did not incorporate in their bill modern improvements; they simply incorporated the Gas-Works Clauses Act with respect to dividend. The boon conferred by that Act was that after the division of 19 per cent. among the shareholders upon their subscribed capital, and the creation of a reserve-fund, all the rest was to be applied to the reduction of the price of gas, and to give power of resorting to the Court of Quarter Session for inquiry into the accounts of the company, and if it was found that these demands had been satisfied, then the court might order a reduction in the price of gas; but there was no remedy till 10 per cent. had been paid. There was no redress in the Court of Quarter Session for any intermediate malversation with respect to profits; it was only when the person applying proved that the rate of 10 per cent. had been exceeded, and all demands satisfied, that they could get any redress. Then what a mockery and delusion it was to apply this to the city of Dublin; for, besides paying themselves 10 per cent, the company had a right to go back and make up deficiencies of dividend for past years. For more than 30 years, in consequence of the extraordinary manner in which they had dealt with their affairs, the company had been receiving 2 per cent., so there was upwards of 30 years arrears of difference between 2 and 10 per cent.; and these arrears might, if this bill were passed into a law, be taken out of the profits of the company before one single farthing reduction in the price of gas was made to the public. Then, after they had recouped themselves for these arrears, there was £50,000 to be accumulated by way of reserve-fund; and the dividend would have to go to pay it all in one way or the other. This showed the entire mockery and delusion with which the bill was framed as a remedial measure, so far as it concerned the conferring any benefit upon the people of Dublin. No benefit could, for many generations, result to the inhabitants from these provisions; and therefore they were in reality now offering nothing.

Mr. BURKE: My lords, I have a right to object to these arguments, which are not consistent with the bill. The Act of Parliament provides this, that if the dividend falls below the prescribed amount, then you may recoup yourselves; but that applies to the period when the dividend has been limited. It cannot go back to the formation of the company; we cannot recoup ourselves for any period antecedent to our incorporation and limitation by Act of Parliament.

The CHAIRMAN said that he did not see there was any limit by the Act of Parliament, but no doubt Mr. Burke would be willing to have it limited.

Mr. BURKE said he should be wiling to have a limit fixed.

Mr. O'MALLEY said that no doubt the company would limit it anyhow, so long as they managed to get their bill. It was all very well when thes things were pointed out for his learned to say the company would submit to such and such alterations, but when their lordships looked at the peculiar position in which the company stood, having got a start of their rival on technical grounds, he thought that this company ought not to be helped out of their difficulty and a new bill modelled for them. If this bill passed into a law it would, in the first place, be necessary to entirely disentangle Dublin from Limerick, and Limerick from Dublin; how this was to be done was a most difficult question to solve, but if it was not done, gross injustice would be done to one city or the other. It was a remarkable coincidence, and showed the way in which those bills were got up, that on the very day that Mr. Barlow and Mr. Hawksley inspected the gas, the illuminating power was 2 candles higher than it ordinarily was. Ingenious Mr. Hawksley suggested as a reason, that a fresh supply of coal had been received; but surely the company had had fresh coal in on many previous occasions. Yet it was an extraordinary fact that Mr. Barry, who had looked through the book in which the tests were kept, could find no other instance of the illuminating power being so high. In fact the company threw this indigested bill upon the table, and in effect said, "We will submit to anything, but give us a bill in any shape." There was no doubt, as would be shown in evidence, that the public authorities of Dublin, and also the inhabitants, were dissatisfied with the proceedings of this company. His learned friend had said that the petition from Dublin was not numerously signed; that might be, but the signatures were those of gentlemen who represented great capital, and who filled positions of the highest respectability in the city. A public meeting had also unanimously condemned the proceedings of the promoters of this bill. The inhabitants of Dublin were favourable to a consumers company—they held out their hand to it; and what they wanted was that their lordships should not prejudge the case between the two companies, and give this company their indigested bill, but let both companies come before Parliament with their repective schemes, backed by whatever interest they might have, and then Parliament could decide as to the merits of each. The inhabitants had a right to get the best gas they could at the lowest price, and if it could be shown that another company, possessed of all modern improvements, were prepared to supply better gas at a lower price, then in justice to the consumers Parliament ought to allow such company proper powers. In conclusion, he might briefly remind their lordships that Dundrum, in which the company now sought to establish themselves, was now lighted by another company, in favour of which a petition was now presented to their lordships, and he trusted their lordships would not allow the United Gas Company to enter as invaders there. With respect to Kingstown, too, a company was already established there, and were now under a contract with the Lighting Commissioners, and it had been shown that that company was in a position amply to supply Kingstown with gas. With these observations, and apologizing for the length of time he had occupied in making them, he left the case in their lordships hands, trusting that they would be of opinion that this bill ought to be postponed to another session of Parliament, when both parties could come before their lordships with their bills amended. That would injure neither party, and do no harm to any one, and at the same time satisfy the justice of the case.

At the request of the chairman the room was then cleared. On the readmission of the public,

The CHAIRMAN said: The committee have come to the conclusion that the preamble of the bill is not proved, even on the showing of the witnesses, and therefore they do not require any evidence on behalf of the petitioners.

Legal Intelligence.

COURT OF QUEEN'S BENCH.

WESTMINSTER, WEDNESDAY, MAY 31.

(*Sittings in Banco, before the Lord Chief Justice* COCKBURN, *and Justices* CROMPTON, BLACKBURN, *and* SHEE.)

STEVENS AND ANDERSON *v.* THE CHURCHWARDENS OF ALDERSHOT.

The question here was as to the rateability of gas contractors at the camp of Aldershot in respect of premises occupied by them, but the property of the Crown. They were rated for "gas-works and premises," the "name of owner" being stated in the rate as "the War Department;" and "the name and situation of property" being stated as "the Camp." The contractors appealed to Quarter Sessions, on the ground "that they are not occupiers of the works or premises, but have a mere licence, permission, and privilege to use the works in a particular manner, the legal possession remaining in the Crown." The facts were these:—The camp gas-works are extensive gas-works, the property of the Crown, erected at a great expense by the Government, under the direction of the Board of Ordnance, in 1861, for the purpose of supplying gas for the lighting of the camp established at Aldershot, and the Government buildings connected with it. The appellants are gas engineers, contractors for gas-works, residing in London, and in July, 1862, they entered into a contract with the War Department, under which they suppply gas and use the works for that purpose. The contract was by deed entered into between the contractors and the Secretary of State for War, and it did not in terms purport to be a lease, but rather a licence. It commenced thus:—"Between Her Majesty's Principal Secretary of State for the War Department, for and on behalf of Her Majesty (in the deed throughout called the 'licensor'), and the contractors," and then it witnessed that the Secretary of State, called the "licensor," granted to them "full and free licence to use the buildings, &c., for carrying out their contract for supplying the camp with gas." The deed contained an express clause that it should not be a lease, or an agreement for a lease, or in the nature of a lease, and that the contractors should not have any term or interest in the premises, and that the premises should not be vested in them. There were, however, covenants that they should repair and uphold; while, on the other hand, there were covenants that they should only use the premises for gas-works, and there were likewise covenants that the Secretary of State might, without revoking the licence, enter and inspect the premises from time to time, in order to ascertain the condition of the works, &c. The contract was for the supply of gas for seven years, and the deed of licence was to use the premises for the same period. From the time of the deed and contract the contractors had used the gas-works according thereto, and have made and supplied gas to the Government, the gas being made by them on the gas-works and supplied into the meter, from which the servants of the Government supply the gas to the camp and Government buildings. The contractors have in their employ a manager of the works, who resides upon the premises. He keeps one key of the meter-house, the Government officer, the barrack-sergeant, keeping the other, the keys being of different make, so that neither of the parties in possession of the keys can gain admittance without the other. The barrack-sergeant goes to the meter twice a day to turn the gas on and off. The keys of the other parts of the premises are kept by the manager, though they are the property of the Government. Persons in the employ of the Government have free access to the premises, and come in when they please without asking permission. There is a store of iron gas-pipes belonging to the Government kept upon the premises, and there is a well upon the premises which has lately been opened by the Government authorities, and which is used by them, and from which they take water as they require it for the houses in the camp and for the use of the Commissariat Department. It is necessary for the proper management of the premises that the manager should reside upon the premises, and he does so, and is paid by the contractors who do not reside there. The contractors pay no rent, and no allowance is made for rates. They derive a profit from the supply of gas to the Government, and from the sale of coke and tar to the public, and their names are on the doors of one of the buildings.

Mr. GIFFARD, Q.C. (with him Mr. GATES), argued for the parish officers that the contractors had exclusive and beneficial occupation of the premises, and therefore were rateable.

Mr. Serjeant HAYES (with him Mr. M'MAHON and Mr. C. F. RUSSELL) argued for the contractors that they were not liable to be rated, not being in exclusive occupation, but being mere licensees for the use of the premises for the purposes of the gas-works; the possession, or at all events the right to possession, remaining in the Crown.

Lord Chief Justice COCKBURN, however, said the contractors had really a beneficial occupation and possession of the premises. As to the right of the servants of the Crown to enter—it was either under the express stipulations of the deed or by licence of the contractors, and in either case tended to show that they had possession. In every lease, almost, there was such a right reserved to the landlord to enter and view the premises, but this did not render it any the less a lease. Nor was a lease the less a lease, if it was really so, because it was called a licence. If the deed really made the contractors tenants of the premises, it did not matter that it said they should not be deemed tenants. That might be to preclude the necessity for an action to eject them in case of a breach or neglect of their duty under the contract. What the Poor Law required was only beneficial possession or occupation. This might be by a tenancy at will, as well as by a term of years. The contractors were not the less in possession because it was for a certain purpose, and the purpose was for their own benefit, for they earned a profit. Exclusive use of premises was exclusive occupation, and exclusive occupation was possession. Nor was it less the exclusive possession of one party because he allowed the other to enter from time to time. The deed must be construed by its scope and purpose, which was the use of the premises by the contractors as a gas manufactory. It was quite inconsistent with that purpose that the Crown should have a right to allow any one else to manufacture gas there. Besides, there was an express stipulation not to revoke the licence without certain notice. It did not matter whether the tenancy was at will or on sufferance. There was the right to exclusive use for a purpose which implied and required exclusive use; and exclusive use of premises was exclusive occupation, and as the occupation was beneficial it was rateable.

Justice CROMPTON concurred. Licence to use, he said, is letting to occupy. There is no magic in words; we must look to the scope of the deed, and its object is the exclusive use and occupation of the premises by the contractors for the exclusive manufacture and production of gas. That is profitable occupation, and it is rateable.

Justice BLACKBURN also concurred. The whole effect of the agreement must be looked at, and its effect was to give the contractor exclusive occu-

pation for a terms of years, but the word licence was used. The covenants were those of tenants. How could they yield up premises if they had not got them in their possession; and what need of express stipulation to allow the Crown to enter if the contractors had not possession?

Justice SHEE likewise concurred. The substance of the deed was to make the contractors tenants, and there were elaborate and unusual stipulations applicable only to tenancy.

Judgment for the parish officers.

Miscellaneous News.

ORIENTAL GAS COMPANY, LIMITED.

The Ordinary General Meeting of the Shareholders of this Company was held at the London Tavern, on Monday, May 29—W. T. FAWCETT, Esq., in the chair.

The SECRETARY (Mr. A. Hersee) having read the advertisement convening the meeting, the seal of the company was affixed to the register of proprietors. The following report, with the statements of account annexed, was then presented:—

The directors have the pleasure of submitting to the shareholders the accounts for the twelve months ending 31st of December, 1864, and are happy to report satisfactory progress in the operations of the company. The public and private lights have steadily increased, the respective totals on the 31st of December last reached 1263 and 9018, as against 1174 and 7032 at the corresponding period of the year 1863.

Eight miles of additional mains have been laid during the past year, and the work of main-laying has since been actively pursued. The whole of the pipes contracted for have arrived in India, and the entire quantity required in connexion with the recent grant of public lamps, will be laid in the course of the present season.

The shareholders are aware that in the month of October last a cyclone, involving great loss of life and property, swept over the city of Calcutta. Your directors are able to congratulate you on the comparative escape of the company's works and stores, and to announce that the manufacturing process has been carried on without any serious interruption. The injury to the mains and otherwise has received the careful attention of the manager, and the plant is now in good working order.

It is with feelings of painful regret the directors have to announce the decease of their late esteemed and respected chairman, Captain James Barber, who from the formation of the company had presided over its affairs with the utmost ability, and at all times displayed the warmest interest in its success. To supply the vacancy, your directors, in accordance with the Deed of Settlement, provisionally appointed James Sydney Stopford, Esq., a director of the company. Mr. Stopford has acted efficiently as one of your auditors since the commencement of the undertaking, and is consequently well qualified to discharge the duties of director. The late Captain Barber would in due course have retired on this occasion, therefore Mr. Stopford having provisionally succeeded him, will vacate his seat at the board at the ensuing ordinary general meeting, but solicits a reappointment at your hands. You will be called upon at the extraordinary general meeting to elect an auditor in the room of Mr. Stopford.

In their last report the directors informed you that the administration of the company's affairs at Calcutta had been entrusted to Charles Bathurst Stewart, Esq.; they sincerely regret, however, to state that death deprived the company of his services shortly after his arrival in India. This sad event has caused Mr. Anderson to prolong his stay in Calcutta, and, pending other arrangements, he continues to conduct your affairs.

The directors have to report that, in consequence of the largely increased demand for gas, it has been necessary to provide additional storeage accommodation. A contract has been entered into with Messrs. R. Laidlaw and Son, of Glasgow, for the supply and erection of a new telescopic gasholder, 120 feet in diameter, and 44 feet high, with cast-iron tank. This, with the present gasholders, will meet all probable requirements for some time to come. A new coal store, and engine and boiler house, together with extensions in the retort-house and purifying-house have been decided on and commenced; other additions and improvements are also in active progress, and the whole will shortly be completed and made available. Consequent upon the carrying out of the above works, the acquisition of additional land adjoining the company's manufacturing station at Narikaldangah was imperative, and your directors are happy to announce that a sufficient quantity has been secured for all future requirements.

To provide for the expenditure involved in the foregoing and other extensions of the company's operations an increase of capital will be required. The directors propose to recommend the issue of 30,000 new shares of £5 each, on which the sum of £1 per share shall become payable in two moieties—*i.e.*, 10s. per share on or before the 1st day of July next, and 10s. per share on or before the 1st day of October next; the said shares to be offered at par, *pro ratâ*, to the present proprietors. In conformity with the Deed of Settlement, an extraordinary general meeting has been summoned to consider this measure.

The directors cannot conclude their report without bearing renewed testimony to the ability and energy displayed by the engineer and manager, Mr. Mellor, in advancing the prosperity and importance of the company.

The balance available for dividend is £8638, out of which the directors recommend a distribution of 5½ per cent., free of income-tax, payable on the 12th day of June next; making with the interim payment of 2½ per cent., on the 12th of December last, a total dividend of 8 per cent. for the past year.

The following directors retire from office—viz. George Denny, and James Sydney Stopford, Esquires, but being eligible for re-election, offer themselves accordingly. The remaining auditors, Henry M'Lauchlan Backler, Esq., also retires from office, and offers himself for re-election.

Dr. *Balance-Sheet, December* 31, 1864. *Cr.*

To 149,421 shares, of £1 each		£149,421	0	0	
579 „ „ (15s. paid).		434	5	0	
				£149,855	5 0
Unclaimed dividends				226	6 8
Wear and tear account—					
Balance, 1863	£124 5 4				
1864	1,015 19 0				
	£1,140 4 4				
Less—repairs and expenses for the year	694 2 10				
				446	1 6
Amount due by the company				5,065	10 7
Balance from general revenue account				8,638	0 0
				£164,231	3 9

By Amount of plant on December 31, 1863		£92,982	9	9	
Expended during the year 1864		10,435	7	4	
				£103,417	17 1
Cost of plant to December 31, 1864				£103,417	17 1
Amount due to the company				12,582	18 0
Value of stocks, viz.:—					
Coals	£1,568 5 0				
Lime and purifying material	483 7 0				
Products	2,707 1 3				
Meters	1,115 7 3				
Fittings	13,581 9 4				
Pipes	16,097 8 10				
Services	390 12 0				
Horses, conveyances, &c.	524 10 0				
Sundry stores	1,699 4 0				
Office furniture, &c.	385 12 0				
				38,552	16 8
Balance of passage expenses				656	17 7
Ditto in Calcutta	£475 8 8				
Ditto in London	2,045 5 9				
Bills receivable	6,500 0 0				
				9,020	14 5
				£164,231	3 9

Dr. *Profit and Loss, or Working Account, for* 1864. *Cr.*

To Cost of coal used		£8,695	0	4	
Ditto of lime used		161	9	1	
Salaries in India and London		823	6	2	
Engineers salaries in India		763	8	2	
Directors and auditors		692	0	0	
Wages in India		1,701	11	6	
Passages of engineers and workmen		328	8	9	
General expenses, including rent, gharry expenses, postages, advertising, printing and stationery, medical attendance, insurance, and petty charges		509	16	7	
Wear and tear account		1,015	19	0	
Bad debts and allowances		118	10	0	
				14,809	9 7
Balance				11,189	8 6
				£25,998	18 1

By Gas-rental		£19,676	14	0	
Coke, tar, fittings, and meters		6,306	11	7	
				25,983	5 7
Transfer fees				15	12 6
				£25,998	18 1

Dr. *General Revenue Account, December* 31, 1864. *Cr.*

To Payment of 5 per cent.—balance of dividend of 7½ per cent. to Dec. 31, 1863, declared at the general meeting, May, 1864	£5,937	10	0		
Interim dividend of 2½ per cent., on account of year 1864, paid Dec. 12	3,593	15	0		
Income-tax	261	13	4		
				£9,792	18 4
Balance				8,638	0 0
				£18,430	18 4

By Balance of general revenue account, 1863				£6,682	2 10
Ditto of profit and loss account, 1864	£11,189	8	6		
Ditto of interest account	559	7	0		
				11,748	15 6
				£18,430	18 4

The CHAIRMAN in moving the adoption of the report, said the first point which presented itself for remark was the loss which the company had sustained in the death of their late chairman, Captain Barber. He had been connected with the undertaking from the outset, and the energy and ability displayed by him in promoting the interests of the shareholders, had laid them under deep obligations. He was sure that every gentleman present would sympathize most heartily with the sorrowing relatives of Captain Barber, while they felt deeply sensible of the loss which they had themselves sustained through his death. The directors in presenting their report, desired him to say that they congratulated the shareholders upon the favourable character of its announcements. Notwithstanding some severe disappointments, notwithstanding some confusion into which from various causes which we would explain hereafter, their affairs had fallen during the past year, the directors were still able to keep up the charm of an increasing dividend. It was not so large an increase as they could have wished, but, under all circumstances, he thought it was one which must afford the shareholders satisfaction, and encourage in them the hope of still better result in the future. In the first place there had been a change in the superintendance of the company's affairs at Calcutta. That excellent managing director who had been so many years superintending their operations in India, had been obliged to relinquish his position. His successor, from whom the directors had great expectations, had scarcely entered upon the duties of his office when he was removed by the hand of death. The company were therefore without a managing director and chief engineer, Mr. Mellor, who had previously been obliged to leave for the benefit of his health, being still absent. The consequence was that the subordinates of the company did not conduct the affairs in a satisfactory manner. To add to their misfortunes, the cyclone swept over the city of Calcutta, doing as they had heard an immense amount of damage. The company, however, sustained little or no pecuniary damage from it, and no serious interruption occurred to their operations. Looking, therefore, to all these circumstances, he thought the shareholders would be gratified that the directors were able to offer an increased dividend on the pre-

sent occasion. It showed that the undertaking possessed a large amount of elasticity, and that it had arrived at a sufficient degree of maturity to justify the brightest expectations for the future. With reference to the progress of the public lighting of Calcutta, the report was deficient, but this was no fault of the directors. The matter was progressing much faster than they had anticipated. The municipality had undertaken to provide their own lamp-posts, but they had not yet obtained them, and the consequence was the increase in the number of public lights during the year had been only 89, but the directors believed it would be much greater in the present year. The private lighting had, however, largely increased. In 1862, the increase was 1655; in 1863, 1825; and in 1864, 1986 burners. Although in respect to the public lights the increase had been only 89, the company had on their books new orders for 786, and when he mentioned that the price of each light was £9 per annum, they would see at once that this represented an increased rental of upwards of £7000. The board were not sanguine enough to believe that all these would be obtained during the next year, but they had reason to hope that about 500 of them would be lighted during that period. Again, when he stated that the orders for private lighting were occupying all the attention of their workmen, and that the manager was asking for more fitters, he thought the shareholders would regard their prospects as very encouraging. Having arrived during the past year at a rental of about £20,000, he believed they might fairly hope to increase that amount 20 or 25 per cent. during the current year. The whole thing was becoming much larger than the board had ever anticipated it would be, and it would now become necessary to increase the capital of the company. The undertaking was commenced on a very small scale; the promoters not being so sanguine as to the amount of work they should do, although perhaps they looked for more profit upon their operations at an earlier period. They began with 25 miles of mains; they now had 100, and their extensions were constantly going on. The company required new capital for several reasons. In the first place, it was needed for extensions they had already determined on. It was also required because the directors were in communication with new places, and it was of importance to prove to those with whom they were negotiating, that whatever contracts the company undertook they had the power to carry out. It was further necessary to have uncalled capital for the purpose of becoming a partial security, for the debentures which it was proposed to issue at as low a rate of interest as possible. It was according to the expectation of some of the large shareholders, that they would be able to get money at a very low per centage, and if so, they would be in a position to increase the dividends of the proprietors. The former capital was called up in small amounts, but it was now proposed to go to the full extent of the powers allowed by the Deed of Settlement, and at once to call up £150,000 in 30,000 shares of £5 each, making the total capital of the company £300,000. The payments upon the new capital would be made in two instalments—10s. per share on the 1st of July, and 10s. per share on the 1st of October. These calls would produce £30,000, and probably that was all that would be required for a long time, if they succeeded in borrowing money as he had stated, at a low rate. Certainly the directors would be in no hurry to make further calls under such circumstances. The shareholders would probably require to know why the directors had altered the denomination of the shares, and why they proposed to raise the new capital in £5 shares instead of as before in £1 shares. The reason was this, the board would very shortly propose to the shareholders to consolidate the present capital of the company into shares of £5 each, and they thought it best, as they had the power by the deed not to have to alter these shares at that time, but simply to alter those already created. They would require to have an alteration in the Deed of Settlement for this purpose, and also with reference to the time of meeting. The board had had an earnest request from the engineer at Calcutta, that they should so arrange as to hold their annual meeting in November, as it would enable him to make up the accounts at a period when it was of less importance to the interest of the company to call men off their work to take stock, and furnish him with the necessary data. The directors anticipating the consent of the proprietors to this arrangement, had already sent instructions to Calcutta that the accounts in future should be made up to the 30th of June each year, and they intended at the proper time to submit a resolution fixing the time of the annual meeting in the month of November. The next meeting would accordingly be held next November, when an interim dividend up to June would be declared, and the remainder of the year's profits would be divided at the corresponding period in 1866. There were some other alterations required in the company's deed, and the solicitor was now considering the various points, which would be ready for consideration at a special meeting to be convened in about a month from the present time. By virtue of the powers vested in them, the directors had filled up the vacancy at the board caused by the death of Captain Barber, by appointing Mr. Stopford, whose previous connexion with the affairs of the company, he having been one of the auditors from the commencement, gave him special qualifications for the office. As this was the time when Captain Barber would have gone out of office, Mr. Stopford, standing in his position, now came before the shareholders for re-election, and should the opinion of the meeting be in his favour, it would be particularly gratifying to his colleagues. With these remarks he would move "That the directors report, together with the statement of account, be received and adopted."

Mr. CUBITT seconded the resolution.

Mr. THOMPSON inquired what reason the directors had for desiring to increase the shares from the nominal value of £1 to £5 each. He also requested information as to the proposed extensions at which the chairman had hinted. And further, he desired to know how, if the shares were altered in denomination, the holders of less than five shares would be dealt with.

Dr. BEATTIE said the perusal of the report had not filled him with the satisfaction which it appeared to have inspired in the chairman. He thought it was unnecessary to increase the value of the shares, but if it were to be done, he hoped the consolidation of the present stock would be effected before the new arrangement was adopted, otherwise the distribution would be very inequitable among the present shareholders. The alterations necessary in the Deed of Settlement must have been obvious to any shareholder who had taken any part in the proceedings of the company. It was a very lengthy deed, and in many respects had not been adhered to, the directors having acted illegally. He expressed his astonishment that the board had not made such a provision for the superintendence of the works in Calcutta, as would have prevented disorganization under the contingencies which had been adverted to. He hoped the chairman would give a distinct reply to the inquiry addressed to him, as to the new towns, the lighting of which the directors proposed to undertake, so that the shareholders might be able to judge of the expediency of raising so large an amount of capital as they were now asked for.

Mr. FRANKLIN hoped that timely notice would be given before any new ventures were undertaken, so that those of the shareholders who were satisfied with the Calcutta enterprise, might have the option of taking or declining their proportion of the new capital. He believed that a very small proportion of the £150,000 proposed to be raised would be required for Calcutta, and therefore the shareholders ought to be informed of the basis of the calculations upon which the directors rested as to the remunerative character of the new undertakings they had in prospect.

The CHAIRMAN said with reference to the proposed change in the denomination of the shares, it was a matter which had been pressed upon the board at various meetings. They believed it was advisable, and when the proposal came before the shareholders, it would be for them to say whether it should be carried out. As there was only one proprietor who held less than five shares, there would be no difficulty in placing him in a proper position. With regard to the towns the lighting of which was in contemplation, he would only say that the directors had committed themselves to Howra. Fortunately they had got a bill of indemnity from the proprietors for this purpose, or he should be afraid from the tone of the remarks just made that they had gone too far. He would add that they had made it a condition with their engineer that no new works should be undertaken which would not pay 10 per cent. upon the outlay. By a telegram just received, the directors were informed that the engineer had got the land to put the works upon. There were two other places at this moment open to them; they might have a contract for Mirzapore within two or three months, but he very much doubted the policy of the whole of their negotiations being brought before the proprietors at large in every stage of the proceeding. In fact, he believed that such a course would render all negotiation impracticable. For himself, if it were the wish of the meeting, he was quite content with Calcutta; but he was bound to say that he believed there were other places in India where the capital of the company might also be advantageously employed, if the proprietors saw fit to entrust the directors with power to negotiate contracts for that purpose.

Mr. HAMMACK expressed the fullest confidence in the directors, and said he believed that his feeling in the matter was shared in by the bulk of the proprietors around him. He thought, therefore, it was unnecessary that further time should be spent upon the question now before the meeting.

Mr. BACKLER, as the only remaining auditor of the company, said he had given a great deal of time to the investigation of the accounts, and could certify, as upon previous occasions, that every figure was correct, and that, as a whole, the accounts were perfectly satisfactory. Comparing this year with the last, he found that there had been an increase of 11 per cent. in the plant, which had produced an increase of 15 per cent. in the gross rental, 17 per cent. in the gross receipts, including coke, fittings, &c., and an increase in the profits of 34 per cent. The profit last year upon the gross earnings was 34½ per cent.; this year it was 43 per cent. The amount due to the company was rather large—£12,582—and, having regard to the consequence of bad debts, he thought this was a matter which required some attention. The secretary had told him that measures were in progress for allowing discounts to consumers for prompt payment, and probably in that way the outstanding accounts would be reduced in future. The balance in hand was £3693 less than last year, which showed that the resources of the company were husbanded with great care. With regard to the future he understood that the cost of coals would be greatly reduced; there would be a reduction also in the amount of income-tax, abroad and at home, and taking these facts into account, and relying upon the energy and skill of their able engineer at Calcutta, and their excellent secretary in England, together with the good management of the board, he thought the prospects of the company were exceedingly encouraging. As to the capital, he found that in 1861 it stood at £99,000; since then it had been increased by £50,000. This increase of 50 per cent. in the capital had produced an increase of 65 per cent. in the gross rental, and 106 per cent. in the profits. If they could calculate upon that for the future he thought they could not do better than increase the capital again in moderate proportions. The excellent management of the board in the past was an earnest for the future, and he therefore strongly urged upon the meeting to endorse the proposition they now submitted to the shareholders.

Mr. HAMMACK said he observed that the working expenses in proportion to the capital were diminished. The additional income from the public lights alone would be £3500, which would enable them to pay 9 per cent. upon the new capital. It was clear that it was the policy of the company to borrow money at as low a rate of interest as possible, but to do that they must have a large uncalled capital.

Mr. FRANKLIN deprecated the observations made by some of the proprietors, who seemed to think that because he and others had asked for information, they had exhibited a want of confidence in the directors.

Mr. HARNETT thought that that was the natural inference to be drawn from the remarks made, and he was convinced that if the shareholders were to take into their own hands the negotiation of every new contract which might offer, the effect would be to put an end to all profitable extensions.

Mr. BROWN said it would be impolitic to restrict their operations to one place. The directors were not limited to Calcutta, and as they had hitherto proceeded cautiously in every step taken to develop the concern, he thought the future interests of the company were safe in their hands.

Dr. BEATTIE said that he felt that there was a want of confidence on the part of the directors towards the shareholders in the fact that when asking for so large an increase of capital to enable them to go into the interior of India they did not think proper to lay the whole of their scheme before the meeting in the first instance. They need be under no apprehension that other parties would forestall them after what had taken place in the capital of the empire. To go to Mirzapore, or any other town in the interior, would be tantamount to undertaking an entirely new concern, and with the exception of the general manager, and perhaps the chief engineer, they would require an entirely new set of officers and men.

The CHAIRMAN, in reply to Mr. Franklin, said he begged that gentleman distinctly to understand that he did not believe the directors had any reason to complain of want of confidence in the proprietors. They had never had cause to suppose it was so; they rather had cause to complain that, as a rule, the large proprietors kept themselves aloof, and suffered the concern, so far as they were concerned, to go alone. And he would further say that anything like want of respect to Mr. Franklin, or any other proprietor, was the furthest from the intention or wish of the board.

The motion for the adoption of the report was then put, and carried unanimously.

The retiring directors and auditor were severally re-elected, and returned thanks on their reappointment.

On the motion of the CHAIRMAN, it was then resolved—"That a dividend of 8 per cent. per annum, free of income-tax, for the year 1864, be now declared, and that the same be paid to the shareholders, less 2½ per cent. already distributed, on the 12th June next."

The meeting was then made special for the election of an auditor, and to authorize the increase of the capital of the company to £300,000, by the creation of 30,000 new shares of £5 each, the new shares to be issued *pro ratâ* to the present shareholders.

Mr. HADLAND moved, and Mr. BRAND seconded, the appointment of Mr. Jno. R. Peill as an auditor of the company, in the place of Mr. Stopford.

The motion was unanimously agreed to, and Mr. Peill returned thanks.

The CHAIRMAN then moved—"That the capital of the company be increased to £300,000, by the issue of 30,000 new shares of £5 each, in respect of which the sum of 10s. be paid on the 1st July next and 10s. on the 1st October next, such shares to be issued to the present shareholders in the proportion of one new share for every five." The money was absolutely required for the extensions in Calcutta, in Howrah, and other places, also as a guarantee that what the company undertook they were able to carry out. About £60,000 would be required for Calcutta and Howrah in the erection of a large gasholder and new workshops, as well as for laying down mains, &c. It must be remembered that the company were obliged to have a large working capital. Of the existing capital only about £103,000 had been expended in plant; the remainder of the £150,000 represented the working capital, and was invested in coals in store, meters, service-pipes, and various other things.

Mr. WHITE seconded the motion.

A long conversation ensued, Dr. Beattie and others raising again the question of the policy of extensions in the interior of India, which led to explanations from the chairman and Mr. Stopford.

Mr. FRANKLIN moved, as an amendment—"That the new issue of shares be limited to 15,000 shares of £5 each, and that one of such shares be allotted to the holder of every ten shares."

Dr. BEATTIE seconded the amendment.

On a show of hands, the amendment was negatived by a large majority, only three voting in its favour.

The original motion was put, and carried, with three dissentients.

A vote of thanks to the chairman and directors was then adopted, and the proceedings terminated.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

The Half-Yearly Ordinary Meeting of the Proprietors of this Company was held on Tuesday, the 30th of May, at the London Tavern—M. W. ATTWOOD, Esq., in the chair.

Mr. S. J. BROWN (the board-clerk), read the notice convening the meeting and the seal of the association was affixed to the register of shareholders.

Mr. W. P. PEARCE, of the firm of Pearce, Phillips, and Pearce, the solicitors of the association, then read the report, of which the following is an abstract.

The general state of affairs had, upon the whole, been satisfactory.

The consumption of gas had increased in a rather larger ratio than in the previous half-years.

The number of lights also showed a somewhat greater increase.

This extension in the use of the gas had been in a material degree occasioned by the large reductions made in prices, and the rental had therefore naturally not augmented in the same proportion, but it manifested considerable improvement.

Should tranquillity and prosperity continue to prevail in Europe a further progressive improvement might be fairly anticipated.

Wherever it had been found that reductions in price could fairly be expected, such reductions had been made, and every step that appeared practicable had been taken to maintain and strengthen the confidence and friendly feeling of the authorities and of the inhabitants of the towns lighted by the association.

At the same time the constant exertions of the presidents and directors and of their officers had been applied to improve the manufacture and reduce the cost of gas.

At Aix-la-Chapelle, by the judicious proceedings of Mr. G. W. Drory, the experienced general superintendent of the establishments of the association on the Continent, in carrying out the conciliatory sentiments of the board of direction in negotiation with the authorities, seconded by the zealous and able services of Mr. Lamberts, the agent, and Mr. Grice, the engineer at the station, the difference with the municipality had been arranged and a new contract had been concluded with the town, both for the public and private lighting, for 45 years.

This had involved large concessions on the part of the association, but the presidents and directors had resolved to show to those towns of which the lighting had been entrusted to them, their desire and determination to give them the full benefit of the most moderate and liberal terms that could be expected from any parties capable of appreciating and accomplishing the important and onerous duties connected with such establishments.

The contract for the public and private lighting of the town of Cologne was rapidly approaching its termination, and the negotiations which had been going on for some time for its renewal still continued. Every effort had been, and would be, employed by the board and their able and efficient representatives at Cologne, as elsewhere, desiring as they did to afford to the town every advantage which could be fairly or reasonably expected.

At Frankfort-on-the-Main, the necessary laying of mains in the new districts to be lighted by the association, in virtue of their prolonged and extended concession, had not yet been completed, but was being carried out as rapidly as possible.

It was agreeable to the presidents and directors to be enabled to state, that, through the exertions of Mr. Drory and the representatives of the association at Frankfort, they had been enabled to conclude a contract with the municipal authorities of Bockenheim, a small thriving town immediately adjacent to Frankfort, with a population of about 7000 inhabitants, but forming part of the territory of the Elector of Hesse Cassel, for the lighting of Bockenheim for a term of 25 years for the public lights, with a concession till the year 1959 for the private lighting.

At the other stations in Germany, and at the Dutch and Belgian stations, the workings proceeded with the usual satisfactory results.

And at the stations which remained in operation in France, the business done likewise continued to be good.

The Marseilles cause of the association, which it had been intimated in the report for the previous half year would then shortly be brought before the Council of State in Paris for a decision, had since been heard.

The judgment was in all respects adverse to the association, and it would appear that there was now no legal recourse left to them.

The presidents and directors had still to consider whether or not the matter could be brought forward in any other form in a manner likely to obtain a fair consideration of the merits of the case and the injuries and injustice sustained by the association, with a prospect of gaining redress.

The presidents and directors had now to submit to the proprietors the accounts showing the results of the workings of the past half year, and the scheme prepared in accordance with the provisions of the Act of Parliament.

Finding that from special circumstances, mainly attributable to a diminution in the expenditure for wear and tear and in the cost of coal, the profits for the half year had increased to the extent of £14,000. The presidents and directors were prepared (without expressing any opinion as to the probability of their being enabled to continue so large a division of profits) to recommend an increase of the bonus by 10s. per share.

They accordingly recommended that a dividend of £2. 10s. per share, with a bonus of £1 per share, making together £3. 10s. per share, should be declared for the half year ending the 31st December, 1864, and that the same should be payable, free of income-tax, on and after the 15th of June.

The presidents and directors felt much gratified that they had it in their power to recommend this division of profits, leaving at the same time a fund available sufficient to provide for the immediate wants of the association, and to enable them to proceed with those reductions of price on the one hand, and extensions of works on the other, which the successive reports had stated and detailed.

Experience had shown the expediency of those measures to maintain the position and the interests of the association, and to guard as far as possible against the competition with which it had to contend, and against which it could only protect itself by the decided vigorous and liberal policy which had been pursued.

This system and policy, which had proved so favourable to confirm and augment the operations and the prosperity of the association, could only have been carried out by a firm adherence to the principles which had hitherto been acted upon—of providing adequately from the yearly income for those serious contingencies to which the association was subject.

The presidents and directors could only express their hope that by a patient perseverance in the same course their operations might continue to proceed as heretofore.

They assured the proprietors that their best labours would not cease to be applied to the promotion of the common welfare. And if any state of events should arise which would admit or call for the consideration of any question of increasing the capital by capitalizing or otherwise, the proprietors might be satisfied that their attention would not fail to be given to the examination of so important a matter.

In saying this, the presidents and directors simply repeated the assurance they had before given, that this, as all other matters connected with the welfare of the association would always receive their full attention; and they would wish it to be distinctly understood that they did not pledge themselves to the adoption of any specified course of action, but must be guided by the circumstances which presented themselves.

Inconvenience having been found to arise from the want of uniformity in the system followed for the last three half years in the delivery of the warrants for the joint dividend and bonus—they having been, in the majority of cases, handed to the proprietors or their nominees at the office upon their signing the requisite receipts for the same, and, in other cases, forwarded to the proprietors direct by post, on their written request and at their own risk—and a wish having been expressed by many shareholders that the warrants should *all* be sent out by post alike, the presidents and directors had determined that this course should upon the present occasion, and for the future, be adopted in the case of all proprietors who did not give instructions to the contrary.

The new premises, Nos. 30 and 31, Clement's Lane, were on the eve of completion, and on and after the 1st of July the business of the association would be carried on there.

The CHAIRMAN, after apologizing for the unavoidable absence of Sir Moses Montefiore, said he hoped the report would appear as satisfactory to the proprietors as it did to the board. It would be seen that the directors manifested a strong desire and disposition to give to the proprietors every benefit that could reasonably be expected immediately from the growing prosperity of the company. He was not quite sure that they had not gone a little too far; but at late meetings, so much courtesy had been shown by the shareholders in arguing the question of division of profits, that the board could not fail to reciprocate the sentiments expressed, and perhaps had yielded too much to the seductive and flattering language addressed to them. As regarded the general progress of the concern there was great reason for congratulation. During the last two years, the directors had been engaged in very anxious negotiation for the purpose of renewing some of the contracts which were on the eve of termination. By great efforts and sacrifices several had been so renewed; and they were greatly indebted to those gentlemen by whose skill and judgment these negotiations had been conducted. The proprietors were aware of the difficulties which they met with abroad; but by large concessions, and by the judicious and conciliatory conduct of their representatives, these had been overcome. This had been the case at Amsterdam, Lisle, and Aix-la-Chapelle, and this would show beyond doubt, how reasonable were the prices which they had proposed at Cologne. Mr. Drory had obtained from a gentleman in Germany —a man of political eminence, and connected with one of the largest gas companies there—a letter in the strongest terms to the effect, that supposing the town of Cologne lighted itself, it could not be lighted on terms so good as those which the company offered, and that there was no other company in Germany, or elsewhere, that could offer terms so advantageous. That was as satisfactory a testimony as they could have, proceeding as it did from a source so disinterested, and so perfectly qualified to give an opinion upon such a subject. But, as the report had stated, they had had to make large reductions, which, of course, rendered it necessary to provide for any contingencies which might happen. They could not have made those reductions, if they were at the same time called upon to overweight themselves with capital. One of the most favourable circumstances during the last few years had been the reduction which had taken place in the cost of coals, and the great facilities they found of obtaining them abroad, instead of being wholly dependent upon England for their supply. Another advantage had been that they had not been compelled to keep so large an amount of stock. At one time, at Berlin, they did not consider themselves safe without a year's consumption in hand; but now, although their business had so greatly increased within the last ten years, the stocks which they had at their stations had not increased in proportion. That was a very satisfactory feature in their affairs. He did not know that there was any other circumstance to which it was necessary to call attention; but if there was any point upon which information was desired to be given, he should be happy to render it.

Mr. BECK inquired whether at Marseilles the whole £65,000 was lost, or could they require the town to take the works.

The CHAIRMAN said they had no power to require the town to take the works. So long as the lawsuit was pending, they had been bound to go on making gas to maintain their rights. As soon as the question was finally disposed of, they would have the power of selling the works and the land, which should realize a considerable sum. It had been suggested that they should employ the works for lighting some property connected with the railroad, and with some docks and warehouses; but at present the directors had not decided as to adopting that course.

Mr. S. BARBER thanked the chairman for the courteous tone of his observations; nevertheless, as he did not propose to move any amendment, he deemed it right to record that he and those who acted with him did not alter their view. It was very satisfactory to find the company progressing with the aid of their extremely valuable agent, Mr. Drory, and their engineers at the different stations; but he and others who had made their voices heard in that room were still of opinion that the dividend should be spread over a larger surface. He did not propose to divide any money among the proprietors, but that undivided profits should be written up upon the shares. He hoped the directors would soon come round to that view, as they appeared to be inclined to meet the wishes of the shareholders. He urged the necessity of more explicitness with regard to the manner in which the profit was arrived at; and said that the balance-sheet did not give a distinct view of profit and loss. He congratulated the proprietors upon the proof which they had of the soundness of the opinion which he and others had expressed as to the increasing prosperity of the company.

Mr. MICHAEL was glad to find the directors state they would take into serious consideration the point which had been so frequently urged upon them with regard to capitalization. He would refer to three points. First, he considered it improper not to issue a statement of accounts with the notice convening the meeting, and thus to give every shareholder an opportunity of considering them. For this he should ask as long as he remained a shareholder. Secondly, he contended, with Mr. Barber, that the directors were not acting conformably with their Act of Parliament, and did not give a distinct view of profit and loss. The third point was, that the directors said they would consider. When was that to take place? He joined in the congratulations as to the prosperity of the company, but it did not arise from the fact of having a contingent-fund amounting to £800,000 or

£900,000. The board themselves said it was owing to the tact, talent, and energy of those who had the management of the company's affairs. He argued the expediency of an application to Parliament to capitalize undivided profits, and said that was the principle upon which the company had acted before, and hoped at the next meeting to hear the directors say they were prepared to take the necessary legal steps for the purpose.

Mr. N. STOKES was one of those who were perfectly satisfied to let well alone. They had that day declared a better dividend and bonus than they had ever before received; and having been to the office and examined the accounts, which had been audited and found correct by two highly respectable gentlemen, he gave the board his entire confidence.

Mr. H. R. PRICE considered Mr. Stokes was one of those gentlemen who were thankful for very small mercies, but was sorry to say he did not see the force of the honourable proprietor's observations. He (Mr. Price) remembered being told a short time ago, from the directors side of the table, that there could be no increase of dividend, and would like to know what would have been Mr. Stokes's view if that policy had been pursued. It was the first time in their half-yearly report that they had had the promise with respect to capitalization which they had that day heard; and although it was very much guarded by "ifs" and "buts," he hoped the kernel would prove as large as the shell.

A PROPRIETOR said he had travelled 70 miles to attend the meeting, and suggested the propriety, if it could consistently be done, of sending a copy of the accounts to the proprietors with the notice of the half-yearly meeting. He considered the company was managed in a first-rate manner, and that they had good reason for congratulation, and was proud to belong to such a company.

The CHAIRMAN, in reply, said the question of printing the accounts had been fully considered by the board, and they thought it would be highly inexpedient; and they knew that another association standing in a somewhat similar position had resolved to follow a like course. The directors of the Imperial Continental had had some experience in gas matters, and must be allowed to have an opinion of their own. No other company conducted its affairs under the same circumstances; no other body of directors contained men of greater experience in business, or men more acquainted with the affairs under their control; and they did all that was required of them by any document or any Act of Parliament bearing upon the company's affairs. Mr. Price had been told that if it were desired to have the accounts as he suggested, they could be so presented; but then they would not furnish so much information as they now contained. He was not surprised that some honourable proprietors did not see the force of Mr. Stokes's remarks, because they had not known the company so long as Mr. Stokes had done, and he could, therefore, appreciate what had been done much better than others who had comparatively recently become shareholders. For a number of years they had gone on increasing their dividend without a reserve-fund. The dangers of that position were seen, but there was no intention of permanently setting apart £120,000 a year; but knowing the difficulties in which they had been plunged, when the profits were large a sum was laid by annually for a certain number of years, and the directors had always said it was their intention to increase the division of profits at the earliest possible moment. But they would not do it until they could place the company in a safe position. Mr. Michael had expressed a hope about next half year. The report, however, did not justify the honourable proprietor's sanguine expectations. The accounts contained the fullest materials to satisfy anybody of their correctness. As some observations had been made on the item of wear and tear, he might say that, having compared their items with those of other companies, the Imperial Continental did not suffer by the comparison. But, certainly, in any company with which he was connected he should desire the item of wear and tear to be rather too large than too small; and he was quite sure that every proprietor would concur in that view. Although he did not wish to take undue credit to the board, he thought sufficient consideration was not given to the difficulties which they had to contend with. It must be remembered that the rental per head of the population which they obtained was not half that of London, and only a third as compared with Paris; and under these circumstances, with their wide surface, the result was certainly satisfactory.

The resolution for the adoption of the report and accounts was then carried *nem. dis.*

A motion, authorizing the payment of a dividend of £2 10s. per share, and a bonus of £1 per share, making together £3. 10. per share for the half year ending the 31st December last, free of income-tax, and payable on and after the 15th of June next, was unanimously carried.

The retiring directors and auditor were then unanimously re-elected.

Mr. CHURCHILL moved a vote of thanks to the president and directors for their able services during the half year. He had heard many things that day which had been said over and over again, and he hoped such a motion as that which he submitted would be of constant repetition.

Mr. H. R. PRICE seconded the motion. Although he occasionally differed from the board, he could unfeignedly say, speaking with some knowledge, that they had men on their board, who were not "guinea pigs" or "stags," who did not make use of their position and standing in the City to sell themselves, their name, and their influence, in getting up companies. He considered the directors well deserving of the thanks of the proprietors.

Mr. STOKES supported the motion, and hoped the secretary and the remainder of the staff would be incorporated with it.

The motion was unanimously carried.

The CHAIRMAN briefly acknowledged the vote, and read a telegram which had been received from Sir Moses Montefiore excusing his unavoidable absence.

Mr. S. BARBER, in complimentary terms, moved a vote of thanks to Mr. Drory and the engineers who had made so handsome a profit.

Mr. CHARLES BURLS seconded the motion, stating that if the proprietors really wished to appreciate Mr. Drory's services they should visit such places as Brussels, Cologne, and Antwerp.

The motion was passed *nem. con.*, and the proceedings closed.

BRITISH ASSOCIATION OF GAS MANAGERS.

The Second Annual General Meeting of the Members of the above Association was held at the Institution of Mechanical Engineers, Newhall Street, Birmingham, on Wednesday, May 31—the President, THOMAS HAWKSLEY, Esq., C.E., in the chair.

The following gentlemen were present on the occasion:—

Messrs. Joseph Wood	Gas-Works,	Bury, Lancashire.
James Blackburn	"	Droylsden, Manchester.
William Esson	"	Cheltenham.
James P. Hall	London and N. W Rail. Co.,	Liverpool.
E. S. Cathels	Gas-Works,	Shrewsbury
A. C. Fraser	"	Loughborough.
P. Simpson	"	Rugby.
Joseph Braddock	"	York.
Edward White	"	Birmingham (Windsor St.)
Thos. Hawksley	London.	
A. Owst Atkinson	Kingston-upon-Hull.	
W. H. Chambers	Gas-Works,	Lowestoft.
Henry Newall	"	Littleborough.
Thos. Newbigging	"	Bacup.
Wm. Jas. Moon	"	Malton.
Wm. Wright	"	Shipley, near Leeds.
A. H. Wood	"	Hastings.
James Eldridge	"	Richmond, Surrey.
John Storer	"	Stafford.
James Hodgson	"	Ulverstone.
John Mudie	"	Burton-on-Trent.
W. P. Throsby	"	Lincoln.
W. R. Cooper	"	Banbury.
Dr. Letheby	London.	
Hugh M'Pherson	Gas-Works,	Gloucester.
James Patterson	"	Warrington.
M. Broadhead	"	Great Grimsby
Harrison Veevers	"	Bolton.
Thos. H. Methven	"	Bury St. Edmunds.
Wm. H. Willis	"	Great Yarmouth.
Robert Morton	Equitable Gas Company,	Woolwich.
John W. Lacey	Gas-Works,	Hereford.
G. J. Parkinson	"	Birmingham.
J. H. Robinson	"	Leamington.
John Row	"	Wrexham.
E. Goddard	"	Ipswich.
John Hutchinson	"	Barnsley.
Henry Woodall	"	Longton.
William Longworth	"	Dukinfield.
Wm. Smith, jun.	"	Hyde.
Wm. Blackburn	"	Hebden Bridge,
Wm. Fleming	"	Lancaster.
A. F. Livesay	"	Ventnor, Isle of Wight.

Visitors introduced by members:—Dr. Alfred Hill, Birmingham; Mr. J. E. Clift, Birmingham; Mr. Geo. Piggott, Birmingham; Mr. W. Sugg, London, &c. &c. &c.

The PRESIDENT opened the proceedings by delivering the following

INAUGURAL ADDRESS.

Gentlemen,—I perceive with some little surprise as well as pleasure that I am expected to deliver to you an inaugural address on this the second of the meetings of this association. I assure you I regard that opportunity as an honour; but not having had sufficient notice to enable me to arrange my ideas upon paper, you must accept them, if you please, in such form as I can now clothe them in words. It is a great pleasure to me to observe that this association is gaining strength. At our last meeting I do not think we assembled more than 40 in number, or rather I do not think that at that meeting there were more than 40 on our list. In a short time, however, that number became 92, and we have now 17 new members proposed during the past year. Under all those varying circumstances which operate upon an institution of this character, we have only lost three members, and we, therefore, now number 106. I think that is the best instance, not only of the estimation in which the institution is held, but also of its general utility. I do not think in this very short period we could have gained such an accession of members had it not been generally felt amongst the profession that there was some need for an association of this kind. I know—residing as I do in London—from casual conversation with members who come to London from the country, that considerable interest is felt in the future of this society. It is considered that if we only direct our attention wholly and solely to those objects on which the society was originally based—if we act unitedly and cordially, attempting only the dissemination of truth—that we shall be valued, as I think, under such circumstances, we deserve to be. Hitherto the subjects which have been brought before you are such as have been felt to be interesting to the whole of the profession—I do not mean merely to the profession of gas engineers and their associated members, the gas managers, but I mean to the whole profession of engineers generally. Now, I believe it will be very desirable that in future, amongst those papers read which more particularly refer to the duties, objects, and purposes of gas managers we should have papers which also relate to gas engineering generally. There are a great number of persons who feel very much interest in gas engineering who are not gas managers; and there are a great number of persons who, being engineers, not at all connected with gas, can through the medium of our transactions obtain information which will be useful to them in other parts of the world. Men in foreign parts are often obliged to turn their hands in a moment to anything that may be required. In the present day, perhaps, one-half of all the gentlemen connected with engineering are employed abroad and it does not unfrequently happen that an engineer sent out for a totally different purpose—perhaps connected with railway or bridge building, or some other occupation quite remote from the manufacture of gas will be suddenly called upon to become a gas engineer. Now it is by means of such transactions as I hope we shall be able to put forth shortly, that those gentlemen although they cannot possibly attend to every detail of the business as it is done in England, will be enabled to furnish the benefits of gas lighting to remote places abroad. At all events they can begin the experiment upon a small scale, and if only they succeed in the introduction of a new element of convenience upon that small scale, depend upon it, it will grow until it ends in being produced upon a large scale. Now I find among the papers, a list of which is before me, which will be read to you to-day, and among others which have been promised, many exactly of that character; and I am quite sure, if the discussion of these papers elicits all the information that the members now present can give, and if that information be recorded so as to become available and useful to the world in general, many persons—ourselves amongst the number—will be greatly assisted in their professional career. I think one object which this institution or association is most calculated to attain is not merely the communication of new knowledge, but the comparison of independent results. In many things connected with gas-making, there are great differences of opinion, and these great differences of opinion frequently lead to disputes, and sometimes these disputes are not a little acrimonious. If we mutually assist each other, however, by making independent experiments, and attaining independent results, which are recorded in such form as to admit of comparison, there is no doubt that many things which now create doubts and lead to the disputes to which I have referred, will cease to be the subject matters of dispute at all. There

is also another thing: in the manufacture of gas there have been not only disputes, but there has undoubtedly, in times past, been very much of error, and very much of prejudice. Now, it is by associations of this kind—meetings for the interchange of opinion—that we shall effect the removal of errors, and at all events, if we cannot entirely destroy, we shall greatly diminish the prejudices which now exist. I believe nothing can more secure these two ends than our annual meetings in this or other towns of importance, and on such other occasions as the necessities of the time may demand.

Gentlemen, there are, and have been during the past year—and I think it will be useful on these occasions to allude to the particular topics of the day—there have been during the past year some very important subject matters raised for public discussion, and to some of those I will very briefly refer, because they have been made the grounds of conflict in Parliament, in our courts, and in a variety of other ways. Now, I do think we shall be a little disgraced if amongst ourselves we cannot settle questions of this kind. They are all of a practical nature, and if we cannot come to some unanimity of opinion by actual experiments or otherwise, and by the intercommunication of our separate experiences, why it certainly will not be of very much use to meet in future. I do not despair, however, on that point. I think we shall upon nearly all of those subject matters come to one very general conclusion, and that conclusion, being based on truth and founded on good data, will hereafter receive general acceptance. The topics to which I will allude are mainly these, and I think, perhaps, that they will be subject matters for good papers during the forthcoming year, and for very many useful experiments. There have been many singular doctrines propounded with regard to the purity of gas and the means of purification. Many doctrines of very novel kind have been elicited with regard to the quantity of sulphur in gas, and with regard to the character of its combination much discussion has taken place. I know a gentleman in this room—more than one, no doubt—who can give us some information on that subject. With regard to the possibility of removing sulphur, some gentlemen contend that it can be removed in all its forms, or nearly so; other gentlemen contend it can be only removed in one of its forms. Now, I think, as that is a very important subject, and is attracting the particular attention of the Legislature at the present time, we should devote our attention in the coming year especially to it. Some of you will have particular means of gaining information, because you may have works which admit of experiments being made with great facility, and upon a scale large enough for the purpose without being too large. Large works, unless there are separate apparatus for the purpose, are not very well adapted for experimental results; while, on the other hand, very small works are not available, because they cannot always be applied to the particular kind of manufacture which for the moment is wanted. But there are many works, I believe, in this country, which are divided into sections, and these sections are neither too large nor too small for experimental purposes. Now, if any gentleman will undertake to make experiments upon the particular subject to which I have alluded—I will not at present say how or of what nature these experiments should be, but merely indicate that these experiments can be made—very great benefit will be conferred upon the profession generally.

The same observation, though in a smaller and minor degree, applies to the conditions under which ammonia, one of the most easily extractable bodies, should be extracted, and the extent to which it ought to be removed from the gas.

Another subject, perhaps, is the conditions both of the coal and the mode of manufacture in which some of those products are formed which are deposited in pipes. I believe it is very important to endeavour to ascertain some of those facts more distinctly than they have been hitherto ascertained, and also the particular conditions in which they are transmitted along pipes, why they are condensed in the pipes, and what are the solvents, if there be any, which will prevent their deposition.

Another question which has very much engaged the attention, not only of the Legislature, but also of some of our courts, is the question of the illuminating power of gas, not merely the illuminating power to be given to the gas, but the particular mode in which that illuminating power should be ascertained. Upon that subject there have been two parties formed—I am sorry to say it—but there have been parties formed, and these are almost combinations of people, one of whom asserts one view and another asserts another. I need not allude particularly to the circumstances under which that condition of things has arisen, but I may say that I believe it is in our power to extinguish what I will mildly call the errors which are put forward by some persons who are at the present moment doing a great deal of mischief to gas companies—both in a legislative point of view, and in their practical dealings with the public. With reference to this question, there is one gentleman in the room—our friend, Dr Letheby—who, I have no doubt, will give us most valuable information, for no man has made more experiments upon it than he has done, and those experiments of his are of a very practical kind. He will be able to tell you—and I believe he will tell you this evening—the conditions under which gas should be burned in order to elicit the full amount of the illuminating power contained in it. We have a combination of people who assert that the illuminating power of gas is made by the burner. I need not, of course, tell gentlemen here that the burner has nothing at all to do with the manufacture of the illuminating power, although it may have something to do with the development of the light, which ought to be and is, if I may so express it, held in solution in the gas, and which ought to be given off by the gas, but which very often is not, by reason of the burner being a bad one, and consequently not dealing fairly with the gas of the company. Now, gentlemen, I shall avoid any particular allusion to those who assert, and assert upon authority, that it is the burner itself which is the cause of the difference—the alleged difference—in the quality of the gas; and that, therefore, a particular burner ought to be used in order that the real and true quality of the gas, in regard to its illuminating power, shall be developed. I think, gentlemen, you may do a great deal in the course of next year by making, in your own way, a number of perfectly independent experiments upon different burners, and by doing that and furnishing the results to the secretary of this institution, we shall obtain a mass of evidence which will be perfectly irrefragable, and which will go a long way, if not the whole way, towards the settlement of a question of that kind for the future.

There has been a very singular question raised in France, and it is one which has a very important bearing upon all our employments in connexion with the distribution of gas—viz., the friction of pipes. It has been asserted, on the professed experiments of certain gentlemen in Paris, that there is an enormous difference between the friction of gas in passing through pipes which are new and those which have been laid down some considerable time. Now, I do not for myself believe that, under ordinary circumstances, the amount of difference which these gentlemen assert exists at all; but it is necessary that that question should be settled if possible, because it is having an influence on the commercial value of many important undertakings. If it be true, as is asserted, that gas-pipes—I am not referring to water pipes, because the conditions of water-pipes are entirely different—if it be true, as asserted, that the friction of gas in passing through a pipe a few years old is two or three times as great as it is when that pipe is new, it follows as a matter of course that there is a considerable diminution of the working power of the gas-works; it follows that there is a large depreciation of plant; and it follows, somehow or other, that this depreciation must be allowed for, either in the annual accounts or in some other way which may be more satisfactory than that, though I do not suppose there is any more satisfactory way than that particular method. I am of opinion, however, that these experiments are to a large extent erroneous; but many of you have the opportunity of settling the question, because, when you are laying down mains of considerable length, under circumstances which are favourable to experiments, there is nothing more easy than to take the pressures of the two ends of pipes—if one end is open, the pressure, of course, is *nil* at one end—and to ascertain, by means of the gasholder, the quantity of gas passing through the pipes in a given time. All that may be done by yourselves; and I trust, in the coming year, we shall have some new information on that subject.

Gentlemen, I will not occupy your time very long, but there are two or three other subjects to which it is necessary to allude, because they also have received attention—marked attention—in high quarters. One of those subjects is the utilization of the products of gas-works—the refuse products, as they are commonly called—and the best mode of dealing with them so as to obtain the most valuable results from their manufacture into secondary products; and also as to the mode in which that object may be effected without becoming a nuisance. I have myself recently been in gas-works where some of these operations have been effected, and where they have created no nuisance at all We are too liable at the present day to be attacked on the subject of nuisance, real or imaginary—in many cases we are so attacked—and it would be very desirable for us to remove all ground of offence, if it be possible to do so. Now, if you gentlemen who are manufacturing primal products into secondary products would be so good as to communicate information on that subject, I am quite sure we shall all be glad to receive it.

In the present year two important matters connected with our undertakings have received much attention in Parliament. I suppose every gentleman in this room is informed that there has been a considerable change in the parliamentary proceedings relating to gas bills; and as we are all liable from time to time to have to go to Parliament in regard to the works with which we are severally connected, it is very necessary that some attention, I think, should be paid to the more specific character of the information which is now demanded by the Court of Referees, to whom the House of Commons in the first instance refers all the gas bills; or, at all events, if the House of Commons do not refer them, they become referred by reason of the opposition which commonly arises whenever a gas bill is promoted There are five different subject matters with which the referees deal. They are all stated in the Standing Orders of Parliament; and I think it very desirable that all gentlemen connected with gas engineering should pay particular attention to these subjects, and collect and communicate as much information as they possibly can.

To the other subject I will allude only incidentally, although it has become now a most important one, and one with which we, as gas engineers and gas managers, have necessarily a great deal to do. It is a matter which is not strictly one of engineering, and yet it has fallen almost entirely into the hands of engineers for discussion, both in courts and otherwise, simply because the data which are demanded are unknown to any other class. I allude to that which you will all feel very sensitive upon I am sure, that is, the application of the new law of rating. That is a subject matter which is now becoming of great importance, because in regard to the particular way—the separate and distinct way—in which gas companies are endeavoured to be rated there is much of mistake, and mistakes of this character produce enormous inequality as between gas companies and other manufacturers in the same neighbourhood. In cases with which I have had to deal, in some instances the proportion has been as ten to one against the gas company. I think that by collecting information as to the quantity of plant which a gas company possesses, apart from its land and fixed structures; by ascertaining, as you may very well do, the relative value which each possesses of rateable subject matters—viz., land and buildings, and of removable apparatus or chattels which are not rateable; and by communicating that information to the association without any names attached—putting the works down as A B, C, D, and so on—we may get out of the whole a rule of very easy application, which will enable us to deal with subjects which are now, I will not say obscure, but which are made subject matters of unnecessary conflict and debate.

I think I have now, gentlemen, stated everything which I recollect to have occurred in the past year as forming public topics in relation to matters with which you are specially connected, and having done that I will, without further occupation of your time, proceed to the more formal business of the day, so that we may as early as possible get to the reading and discussion of the papers which appear upon the programme. The first business is to receive, and, if approved, to adopt the statement of accounts, and as that has been already printed and circulated among you, I presume we may take it as read. I shall, therefore, at once venture to move that it be received and adopted.

The motion was put, and agreed to unanimously.

The following gentlemen were then elected members of the association:—

Messrs.	Walter Fildes	Bristol.
	John Storer	Stafford.
	Hugh Young	Birmingham.
	Edward White	Birmingham.
	G. J. Parkinson	Birmingham.
	W. L. Otty	Dewsbury.
	William Dore	Shanghai.
	Henry Cockey	Frome.
	Henry W odall	Longton.
	Corbet Woodall	Stockton.
	William James Moon	Malton.
	J. Eldridge	Richmond, Surrey.
	W. H. Chambers	Lowestoft.
	John Booth, jun.	Stalybridge.
	A. H. Wood	Hastings.
	Harrison Veevers	Bolton.
	Charles R. Robinson	Coventry.
	James Hodgson	Ulverstone.
	J. G. Livesay	Ventnor, Isle of Wight.
	A. Giles	Manchester.

The following papers were then submitted to the meeting, each of them giving rise to a discussion:—"On Gasholders, and their Tanks and Con-

necting-Pipes," by Mr. E. S. Cathels, Gas-Works, Shrewsbury. "On Open-ended Clay Retorts," by Mr. Thos H. Methven, Gas-Works, Bury St. Edmunds. "On the Distillation of Coal at various Temperatures," by Mr A. C. Fraser, Gas-Works, Loughborough. "On the Books of a Gas Company, usually designated the 'Gas Registers,'" by Mr. Thomas Newbigging, Gas-Works, Bacup.

At five o'clock the members and their friends dined together at the Hen and Chickens Hotel, and at seven o'clock a lecture "On the present state of the Chemistry of Gas Lighting" was delivered by Dr. Letheby, M.B., M.A., &c., Professor of Chemistry in the College of the London Hospital, Gas Analyst and Medical Officer of Health for the City of London. This lecture was in continuation of the lecture of last year; the chief points for elucidation being the chemical, physical, and photometrical properties of the principal constituents of coal gas, with experimental illustrations of the best forms of burners for heating and lighting purposes."

A cordial vote of thanks was voted to Dr. Letheby for his able and interesting lecture.

The sittings were resumed on Thursday, at 10 A.M, the chair being taken by Mr. Goddard, of Ipswich, who announced the result of the election of office-bearers for the ensuing year to be as follows:—President: Mr. Thomas Hawksley, C.E., London. Vice-President: Mr. Thomas G. Barlow, C.E., London. Treasurer: Mr. Joseph Adamson, Leeds. Hon. Secretary: Mr. James Blackburn, Droylsden. Committee: Mr. E. Goddard, Ipswich; Mr. William Esson, Cheltenham; Mr. Joseph Wood, Bury; Mr. A. C. Fraser, Loughborough; Mr. E. S. Cathels, Shrewsbury; Mr. P. Simpson, Rugby; Mr. J. T. Hall, L. & N. W. Ry. Co. Auditors: Mr. S. P. Leather, Burnley; Mr. Thomas Newbigging: Bacup. It was then arranged that the next meeting of the association should be held at London in Whit-week, 1866.

On the motion of the CHAIRMAN, seconded by Mr. PATERSON, it was resolved—"That the best thanks of this meeting be presented to Mr. James Blackburn for the very able manner in which he has discharged the duties of honorary secretary to the association from its commencement."

The SECRETARY said he was much obliged to the members for their kindness, and he assured them that he considered it a great honour to be the secretary of such an association, and that although at certain periods the duties thereof entailed a vast amount of labour, he felt himself fully repaid by having secured their approbation. He trusted that the association, in which all present took such a great interest, would continue to increase and gather strength.

It was then moved by the SECRETARY, seconded by Mr. WOOD, and unanimously resolved—"That the best thanks of this association be given to the council and members of the Institution of Mechanical Engineers for their kindness in allowing the use of their rooms for the present meeting."

A hearty vote of thanks to the chairman concluded this portion of the business.

The members afterwards visited the following establishments in Birmingham and the neighbourhood:—Messrs. R. W. Winfield and Co., Messrs. Messenger and Sons, the Imperial Tube Company, the Birmingham Gas Company's works, Windsor Street station, the Birmingham and Staffordshire Gas Company's works, Saltley station.

[In the next number of the JOURNAL it is intended to publish the papers read before the association, with a report of the discussions thereon, and of Dr. Letheby's lecture.]

THE LIGHTING OF SARAGOSSA WITH GAS.—In the report of the council of the Lyons Credit Company to the shareholders, at their general meeting on the 25th of April last, mention is made of several gas undertakings in which the company have been concerned during the past year. They have disposed of 4000 bonds of the Marseilles Gas Company, and 3500 of the Gas Company of Naples. They bought a large number of the bonds of the Union Gas Company which were shortly afterwards offered to the public, when there were many more applicants for them than the number to be sold.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
100	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited) .	5 0 0	5 6 0	5 12 6
10000	5	Do., second issue	3 0 0	5 0 0	3¾ to 3¼
10000	5	Do., third issue .	1 0 0	5 0 0	1 7 6
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29¾ to 30
8200	20	Do., new . . . (Norwich, Huit-Secul oates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27¼
12000	50	*Chartered*	50 0 0	10 0 0	79 5 0
6000	50	Do.	30 0 0	10 0 0	49 to 50½
10000	20	*C. of London*, Ash	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7¼ to 7¾
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
3500	25	City of Moscow (L)	4 0 0		2 to 3
		Colonial & General			
17490	25	*Commercial* . . .	25 0 0	10 0 0	[illegible]
3334	20	Continental G. & W	6 0 0	6 0 0	
2500	20	Continental Union.		0 0 8	0 0 10 15 0
17500	20	Continental Union.	10 0 0	8 0 0	
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
¾ 5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17¼ to 17
5000	10	Do., preference .	10 0 0	6 0 0	12¼ to 12

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
4000	50	*Equitable*	50 0 0	10 0 0	87 10 0
4000	25	Do., new shares.	21 0 0	10 0 0	36½ to 36¾
23406	10	European (Lim.) .	10 0 0	10 0 0	14 0 0
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	7 to 7½
20000	10	*Great Central Gas Consumers* . .	10 0 0	10 0 0	16 15 0
	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	83½ to 83¾
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	94¼ to 95½
3000	40	*Independent* . . .	40 0 0	10 0 0	66 0 0
3000	10	Do.	10 0 0	5 0 0	8 10 0
3900	20	Do.	7 0 0	7 10 0	9 0 0
6886	50	*London*	50 0 0	10 0 0	80½ to 80¾
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
7811		Do., 1st pref. sk		6 0 0	
1828		Do., 2nd pref. sk		5 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
12000	5	Malta & Medit. (L.)	5 0 0	6 0 0	
150000	1	Oriental, Calcutta	1 0 0	8 0 0	1¼ to 1⅜
10000	5	Ottoman (Limited)	5 0 0		3⅞ to 4¼
10000	10	Suez (Limited) . .	10 0 0	5 0 0	10½ to 11
9000	60	*Phœnix*	60 0 0	10 0 0	90 to 91
3600	100	Do., new	10 0 0	7 10 0	14 to 15
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
		Rio de Janeiro (L)			
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference .	5 0 0	7 10 0	
		Shanghai			
4000	50	*South Metropolitan*	50 0 0	10 0 0	82 to 83
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15¼ to 15
10000	10	Do., new	4 0 0	10 0 0	7¼ to 7⅜
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35½ to 36
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited A shares.	10 0 0	10 0 0	16 10 0
10000	10	Do., B shares.	5 0 0	10 0 0	8¾ to 8½
		Do., C shares.	2 0 0	10 0 0	4 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 17 6
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G. M. B.	3 17 6	2 14 [illegible]	[illegible] 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¾ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 6	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	2 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Uncrowned:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Bozhead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	8s. 9d
Cork	9s. 6d. to 9 6
Dover, Folkestone, and Ramsgate	6 3
Dublin	9s. 6d. to 10 0
Exeter Quay	8 6
Ipswich	5 6
London (from Leith)	8 6
London (Pool)	6 0
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7s. to 7 3
Plymouth	8 0
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel:—

Barcelona	£25 10s
Bordeaux	£14 to 15 0
Boulogne and Calais	7 6
Cadiz	17 0
Copenhagen	8 10
Genoa	24 0
Hamburg	8 0
Havre de Grace	9 0
Leghorn	24 0
Lisbon	14 0
Rotterdam	7 10
Stettin	10 5
Trieste	22 0
Venice	25 0

SUNDRIES.

Best Natle. Fire-bks., p 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks (at Wortley), p. 1000.	2 15 0
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p ft. run, 9s. 6d. to	0 7 0
Tough Cake Copper, p. ton	90 0 0
English Pig Lead, p. ton	19 15 0
Welsh Bar Iron (in London), p. ton	7 15 0
Foreign Spelter, p. ton	21 15 0
English Block Tin, p. ton	97 0 0
Banca, p. ton	94 0 0
Tarred Rope Yarn, p. cwt.	1 6 0

The most important undertaking, however, in which the Lyons Company has engaged, is the lighting of the town of Saragossa with gas. In July last the company obtained by public bidding, the right to light that town for fifty years. The price at which gas is to be supplied to the municipality is 31·0458c. per cubic mètre, or about 7s. per 1000 feet. Private consumers, when supplied by meter, are to be charged 10s. 10d. per 1000 feet, and the price per 1000 feet to those who burn without meters is to be estimated at the rate of 11s. 8d. The municipality undertake to fix 800 lamps, therefore the consumption will be considerable from that source alone. The gas is to be made from English coal, or from coal obtained in the country. It is estimated that the cost of the works, mains, and service-pipes, will amount to about £40,000. The land on which the works are to be constructed has been purchased, and it is expected that the lighting of Saragossa with gas will be commenced at the end of the present year.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE WATER SUPPLIED IN ST. MARYLEBONE, IN MAY, 1865:—

	Total Solid Matter in degrees or grains per Imperial gallon.		Organic Matter in degrees or grains per Imperial gallon.		
Distilled Water . . .	May, 1864. 0°	May, 1865. 0°	May, 1864. 0°	May, 1865. 0°	
					Ammo.
West Middlesex water	17·16	16·56	1·12	1·99	
Grand Junction water	19·16	17·84	1·04	1·84	
Well corner of Bond St.	....	61·40	....	6·40	·560
Riding House St. Well	....	68·16	....	5·28	·660

DR. WHITMORE'S REPORT ON THE QUALITY OF THE GAS SUPPLIED IN ST. MARYLEBONE, IN MAY, 1865:—

	Illuminating Power in Sperm Candles.			Mean Pressure in 10ths of an inch.	
	Mean of 22 Observations.	Highest.	Lowest.	Highest.	Lowest.
Imperial Company's gas	13·98	15·54	12·47	20·86	8·00
Chartered Co.'s common gas . .	12·72	14·20	11·00	30·05	11·85
Chartered Co.'s cannel gas . . .	22·27	23·77	20·00	25·30	11·32

The mean illuminating power of the Imperial gas has been during the month nearly 17 per cent. above the standard required by the Act; on three occasions it was over 15 candles, and on ten over 14 candles; the pressure was much better than on many previous months, and was high at the period of the evening when most required; the quantity of sulphur contained in it was small. The Chartered common gas was thrice below the standard in intensity of light, but the mean of the month shows an excess in this respect of nearly 8 per cent.; its pressure has been invariably high, sometimes, indeed, excessive; the sulphur in it was also less than the defined amount. The cannel gas gave a mean light of more than 2 candles over the legal standard, rising on two occasions to nearly 4 candles, and was most free from sulphur; on no occasion was sulphuretted hydrogen detected in either of the gases, but traces of ammonia were constantly present in all.

THE EXHAUSTION OF OUR COAL-MINES.—Mr. Jevons, lecturer to the Owen's College, in Manchester, who has devoted years to the study of this subject, reports his conclusions—conclusions supported by figures—which, wild as they will appear to those who have never reflected on the subject, seem to us almost unanswerable. To prove them we must republish his book, but the steps which he considered proved can be easily summarized. He holds, as a demonstrable fact, that coal cannot be raised by any known appliances, or probable improvement of appliances, from a depth of more than 4000 feet below the level of the sea, or 1500 feet below the deepest existing mine; and that the quantity of coal now existing above that depth is 83,000 millions of tons. The existing consumption is at the rate of 83 millions of tons a year, and if it did not increase the supply would last, with an increasing cost, nearly 1000 years. But, unfortunately, it does increase with the development of population and manufactures at a startling rate—namely, 3½ per cent. every year for the last 80 years. Supposing that rate to continue, and the tendency is to one very much quicker, the consumption would be in 1961 at the rate of 2607 millions of tons a year, and by that time the whole existing deposits of coal will have been consumed. That rise in consumption, however, is impossible, as with exhaustion would come the all-powerful check of rising price; "but this only means that the check to our progress must become perceptible considerably within a century from the present time, that the cost of fuel must rise, perhaps within a lifetime, to a rate threatening our commercial and manufacturing supremacy, and the conclusion is inevitable, that our present happy progressive condition is a thing of limited duration." In short, the indefinite duration of English progressive development, which is based on a boundless supply of coal close to the iron-fields and seats of manufacture, must in about a century stop.—*Spectator*.

THE GAS QUESTION AT GRAVESEND.—On the 1st instant, a meeting of the gas consumers, convened by circular, was held in the Assembly Rooms, Gravesend, in reference to the supply of gas, and the price charged for it. Mr. Crook occupied the chair, and there was a full attendance. In opening the proceedings, the chairman said the result of inquiries which had been instituted, showed that the price of gas at Gravesend was higher than at any other town in Kent, with one exception. Representations had been made to the directors of the gas company, but the only redress promised was, that if at midsummer they found, from the state of the accounts, a reduction in price could be conceded, they would make one. It was feared that the directors only contemplated making a reduction of 6d. per 1000 feet; but the consumers thought it ought to be from 5s. to 4s. per 1000 feet. The consumers had been called together to consider whether it was desirable to take any further steps before the 24th instant, in order to show the directors that a reduction of 6d. per 1000 feet would not be satisfactory. Another point was that, in consequence of being, as they conceived, overcharged, some of the consumers had refused to pay, and the question was whether that course should be generally adopted, and an association formed to resist legal proceedings which might be instituted against them. It was a matter of congratulation that steps had been taken by the Improvement Commissioners for the appointment of an inspector to test the quality of the gas supplied; but, as they would thus have a guarantee that good gas would be supplied, and as the directors were entitled to charge by meter, it would be useless to resist payment. Reverting to the question of price, the chairman said he was not aware what the original capital of the Gravesend Gas Company was, but by a recent Act they were empowered to increase it to £30,000. He had ascertained that the annual income of the company was, in round numbers, £7000, giving a profit of £3000. Such being the case, he considered that they were fairly entitled to ask for a reduction of 1s. per 1000 feet. He begged to propose that the following memorial be signed by the gas consumers, and forwarded to the directors of the company:—"We the undersigned, gas consumers of the borough of Gravesend, being satisfied that the price charged for gas is, compared with other towns in Kent, beyond what is fair and reasonable, respectfully request that you will, from the 24th of June instant, reduce the price to 4s. per 1000 cubic feet." The proposal having been seconded, was unanimously adopted, and every consumer present appended his name. Some discussion took place respecting the formation of a new company in the event of the existing company not conceding the reduction asked for; and it was stated that one gentleman was willing to advance the whole of the money necessary to construct new works. A resolution was passed pledging the consumers present to support a gas consumers company, in the event of one being formed.

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

CLASSES X. & XXXI.

"George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	,,	,,	,,	2·812.
Croll, Rait, and Co.	,,	,,	,,	5·540.
Thomas Fletcher	,,	,,	,,	15·121.
Joseph Boulton	,,	,,	,,	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

CONTENTS.

Notes upon Passing Events:— PAGE

Proposed Transfer of the Fire Brigade to the Metropolitan Board of Works . . . 491
Sir W. Fraser's Motion on the Paving, Lighting, and Cleansing of the Metropolis . . . 491
The New Street at Hyde Park Gate . . . 494
Proposed Removal of the National Gallery to Burlington House . . . 494
The Atlantic Cable . . . 495
The Woods and Forests Administration . . . 495
The Vice-Chancellor's Decision in the Case of the Thames Conservancy Commissioners and the Corporation of Kingston-on-Thames . . . 495
The New Commission on the Pollution of Rivers . . . 495
Rawson *v.* the Local Board of Hitchin . . . 495
Water Consumption in Melbourne . . . 495

Circular to Gas Companies:—
Proposed Application of the Common Council to undertake the Supply of Gas in the City of London . . . 496
The Stroud Local Board and the Gas Question . . . 497
Reduction in the Price of Gas by the Imperial Gas Company . . . 497
The Appeal of the Phœnix Gas Company against the Assessment of their Pipes in Lee Parish . . . 497

Register of New Patents:—
Applications for Letters Patent . . . 498
Grants of Provisional Protection . . . 498
Notices to Proceed . . . 498
Patents which have become Void . . . 498

Parliamentary Intelligence:—
Progress of Bills in House of Lords . . . 498
Progress of Bills in House of Commons . . . 499

Legal Intelligence:—
Court of Exchequer—Beale *v.* Newton . . . 499

Miscellaneous News:—
Metropolis Gas Supply—
Court of Common Council . . . 499
City of London Court of Sewers . . . 501
The Gas Question at Stroud . . . 501
British Association of Gas Managers . . . 503
Dr. Hillier's Report on the Gas supplied by the Imperial Gas Company 514
The Coal Mines of the World . . . 514

Price Current . . . 514

Share List of Metropolitan Gas Companies . . . 515

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

J. S. (Canterbury).—*Anderson's patent of* 1856, *for "Improvements in the combustion of tar and other similar matters in heating gas-retorts, &c.," became void in* 1863 *by reason of the non-payment of the additional stamp duty of* £100 *before the expiration of the seventh year. The system is only applicable to very large works, where* 15 *or* 20 *retorts can be set in operation or thrown out of use at the same time.*

A Creditor.—*Bills of sale are filed at the Judgment Office in the Temple, and lists of them are published in* Stubb's Gazette, *but are accessible to subscribers only. The bill of sale you refer to had not been satisfied a few days since when the file was searched.*

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, July 11, and the subsequent numbers on each successive alternate Tuesday.

This Journal has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JUNE 27, 1865.

Notes upon Passing Events.

This session, the last of a long Parliament, has conferred on the Metropolitan Board the first instalment of permanent duties. Although it will take some years, yet it is not difficult to calculate in round numbers the time when the main drainage and sewerage works, including the reclamation of Maplin Sands and the embankment of the Thames on both sides, will be completed. But the management of the Fire Brigade, although not a very great affair, involves a permanent duty; still it is scarcely enough to justify the maintenance of so imposing a council with so elaborate a staff.

"The whirligig of time brings round its revenges," and the fate of the great creation of Lord Llanover seems to illustrate this truth in a singular manner. The Metropolitan Board, that was created by that legislator, has now been in existence for ten years, and it has, it must be confessed, to a great extent fulfilled the expectations that were excited at the time; but the limits that were placed on the powers of the Board have been found to be so strict that it is now incompetent to effect the reforms that are proved to be required. The fact was, that Lord Llanover roused the opposition of the local vestries, and they, in their turn, roused the antipathy that Englishmen always feel against anything approaching to centralization. The efficiency of the Board has been sacrificed between the two parties, and the fond hopes of the *Times* and of the other ministerial organs have been doomed to disappointment. We do not know how we are taxed, nor do we perceive that there has been any improvement in the manner in which the street-paving is performed, the roads watered, the streets cleansed, the supply of gas and water managed, or the nuisances abolished in this mighty metropolis, as we were taught to believe. All that has been done as yet is to convince the public mind that some such municipal organization as the Metropolitan Board is wanted to deal with these questions; but how that Board should be constituted, or upon what principles it should be organized, seem as yet to have very little preoccupied public attention. There is, however, little doubt, if we may judge from the signs of the times, that every year will bring the Board new duties and new powers. The tone of the House of Commons the other day, when Sir William Fraser made his attack on the parochial management of the non-municipal part of London, was significant. Sir William Fraser is one of those "club lounger" Members of the House, whose utterances do not usually command much attention; when, however, after a vague and general attack on everything, that meant very little, he descended to particulars, and pointed out the inconvenience of such work as street paving and street cleaning being done in bits and patches, and on different principles, by rival parochial parliaments, the whole House was with him. That one end of a street, or even one side of a street, should be repaved at one time, and the other portion at another, in order to preserve all the rights of local self-government, was too evidently absurd for non-parishioners to approve. Common sense calls for either a concentration of street paving and cleaning in one authority, or a redivision of districts on some principle more intelligible than population and parish limits. Repairing and relaying pavement is always a disagreeable operation, but if the whole work of the populous districts were carried out under some definite plan the inconvenience would be reduced to a minimum. This is self-evident, but a reform will be more easily devised than carried out. The modern parochial parliaments are in full swing; each district has built itself a pretty little debating chamber. A large crop of orators have grown up, supported by parish penny and half-penny papers, in which their discourses are reported and commented upon at the fullest length. Retired tradesmen find new and amusing duties in playing at "House of Commons," and fluent lawyers clerks desert the pot-house discussions of the last generation for the vestry-house. The question of a few yards of pavement or a dozen iron rails will afford subject for discussions for a month, for committees of inquiry, for formal reports, for amendments, original motions, divisions, casting votes, personal attacks and replies, callings to order, apologies, and defiances; in fact, very active parodies on House of Commons business in the good old times, when there really were Tories with something to defend, and Reformers with something to attack. Putting on one side whatever there is of good in these parochial parliaments, and there must be some, it is quite certain that they will not surrender any of their rights without a resistance which few ministers would like to encounter gratuitously. Every vestryman, however disgusted with the doings in paving and scavenging of the vestry next door, would consider it an insult to be deprived of a single subject for debate, especially in those parishes where a well-lighted chamber, comfortably furnished with morocco seats, has been provided. Beside the talk there is the patronage—the pleasure

of being canvassed by contractors, of having them in and cross-questioning them from the chair of authority. These are parochial luxuries not to be resigned without a struggle. Nothing less than a financial difficulty will drive vestries to surrender their power of mismanaging street pavements. The House of Commons would like to centralize the management of streets, sewers, and scavengers in the Metropolitan Board; but who will "bell the cats" to be, found in every vestry? Why the Metropolitan Board itself which has the advantage of an annexing power. In such matters attack is always stronger than defence.

For our parts, we cannot help thinking that the management of the paving and other street works by the district vestries has proved a miserable failure hitherto. There is certainly no abstract reason why the local authorities should mismanage whatever they undertake, but the effect of our past experience is to convince us that there is great danger of the affairs that are undertaken by such bodies degenerating into jobbery and cliques, and therefore into confusion. We are decidedly of opinion that some such organization as prevails in Paris would ensure for us a better mode of conducting the public works, only this system must be surrounded with such guarantees as shall prevent it from falling into a state of red-tapism and centralization, that are so apparent in the case we cite as affording a model. In that country the theory is that the engineers are selected from a highly educated, and a profoundly scientific body of men, and that they are responsible to the body of the council that is elected by the town; but the fact is, that Paris is under an exceptional state of legislation, and the members of the Town Council are all named by the Government, who, of course, have their own way in every thing. Still, the nomination of the engineers is managed in a perfectly logical manner, if we suppose the Town Council only to be a real representation of the body of the ratepayers. The works of the city are under the care of the Directeur-Général, who has under him the engineers, who are charged respectively with the *under*ground works, the works *upon* the ground, and the works that are *above* the ground; the Directeur-Général receives all orders that are given to his subordinates, and in this manner he secures the uniformity of action in the several branches of the admistration to which he belongs. The danger of this system is precisely in the irresponsibility of the engineers, at least to the body of the ratepayers; for, as they are now responsible to Government nominees, they are tempted to attain a theoretical perfection in their works, and to disregard considerations of economy. It is contended by the advocates of the French system, that the election of members of the Town Council would introduce a disturbing element in the state, by creating, as it were, an "*imperium in imperio*," that would be more difficult to manage by the reason that the deliberations of that body would more immediately affect the pecuniary interests of the members. It is not for Englishmen, of course, to pronounce a judgment upon the system that our neighbours adopt; but it seems to us that whatever defects may be traced in the application of the French system (as it is applied in Paris, for it is carried out in a truer spirit in most of the provincial towns of France), may be accounted for by the want of a proper control on the part of the population affected. The whole subject of the organization of the public works of France, and Paris in particular, has, however, been treated by our correspondent, Mr. G. R. Burnell, in the papers read before the Society of Arts; and we therefore content ourselves by referring to them for further details.

We are disposed to think that the system of election to the Metropolitan Board of Works would admit of great modification, and that such modification is essential, if it be desired to make that body a really governing one, that should have the confidence of the ratepayers. At present the representatives that sit in the board are elected from the vestries; and they thus are elected in the second degree, and without any direct communication with the body of the ratepayers. The chairman of the Board is elected for life, and there is no security that he will be neither a King Log nor a King Stork; though we will say most distinctly that Sir John Thwaites has nobly fulfilled the duties that he undertook, and we should be very sorry to see him removed from his high office. Still there is something absurd in making thus the chairman an officer elected for life, whilst the members over whom he presides are elected, in the very absurd manner we have named, every three years. The object that the designer of this Bill had, seems to have been to provide for the maintenance of the traditions of the office, and certainly he has succeeded in the attainment of that object, by the conditions with which he has surrounded the election of members, and the perpetuity of the chairman. Is this a desirable condition? We think not, and we are decidedly of opinion that both the members and the chairman would gain in efficiency if they were brought into contact with the ratepayers, *directly*, at certain intervals, that might be made as long or as short as public convenience might require. The suspicion that hangs about the proceedings of the Metropolitan Board, in the Thames Embankment, and some other matters, may be, in fact, attributed to the difficulty of exercising any control over the proceedings of that body: it would be far worse were they to have the control of all the works that it is now sought to place under their management.

This at least seems certain, that the present tendency of the public mind is to increase the powers of the Metropolitan Board, and to suppress all local jurisdictions that are likely to interfere with the exercise of the powers of that body, as far as concerns the execution of the public works. We are fast approaching the time when there will be one, or two, corporations charged with the maintenance and the improvement of the City; and we ourselves cannot say that we look with regret on the prospect. The existence of the Corporation of London has now ceased to have any real political or moral necessity; the separate vestries are known to be a serious let and hindrance to the transaction of business, and the Union Chargeability Bill may be considered as a proof of the temper in which the pretensions of those bodies are now regarded. What is to succeed these ancient organizations? How can the new ones be made to suit our modern notions of representative government, and to ensure the efficient responsibility of the persons elected? Sir John Thwaites seems to have had different notions on the subject from those that he now must be taken as representing, when he addressed the meeting that was held at the Bridge House Hotel, to protest against the adoption of Sir Benjamin Hall's Bill; but the opinions that were then expressed by the worthy knight may be even now taken as conveying the truth of the matter. Then Sir John could distinguish the inconvenience that would result from leaving the paving, lighting, sewerage, &c., to the care of a select vestry, and he could find many reasons for preferring the organization of a municipal Corporation for the same objects. It is curious to read the opinions of a man who has forced his way up in the world, during the various phases of his career; but the opinions that were expressed by Sir J. Thwaites on the occasion referred to might well be taken even at the present day as the best solution of the difficulties of the case. Why should there not be a separate municipal Corporation for the south side and the north side of the Thames elected upon the most liberal principles?

An attempt to recommit the Bill for the Brompton street improvement failed, on the strenuous opposition of the chairman, Lord Galway, an amiable and narrow-minded country gentleman, just fit to legislate for a pack of fox-hounds, and nothing else. We only refer to the subject because Lord Galway's argument against the Bill was really an argument in its favour, as Mr. Tite very justly showed. It was objected that the promoters sought powers to take 45 acres when they only required 15 acres for their street—that is, a third of 45 acres. Why nothing less than two-thirds more than the quantity employed in a street will make a town building speculation pay. Government cannot afford to make new streets, neither can or will the Metropolitan Board. The only resource then is in private companies, and to put them in motion an ample margin of profit must be offered them. Such people as Lord Galway are very nice in the country, and very safe on general questions of public policy, but if such had their way there would be no railroads, or only the railroads in which they were directors.

The questions of the National Gallery and the Royal Academy seem likely to be satisfactorily settled—at least, it will not be for want of liberality on the part of Parliament if they are not. The Government proposes to give the National Gallery a new front towards Trafalgar Square, and extend it behind by purchasing St. Martin's Workhouse and extinguishing Castle Street. Nothing can be better than the idea; all the success depends on how it is carried out. It is quite possible that the unfortunate architect of the National Gallery would have done himself credit if he had not been harassed by preposterous regulations for the protection of St. Martin's Church portico. It is, however, to be hoped that a

complete plan will be prepared before any building is commenced, and one of our best architects employed. As to the second part of the arrangement—the removal of the Royal Academy to the quadrangle of Burlington House—that ought to satisfy every one. The Academy is rich, and may be expected to build something that will be an ornament to Piccadilly on the incomparable site presented by the Government. We shall get rid of that hideous brick wall that now hides the Earl's architecture, and we may hope to see the example carried along the line of what ought to be the grandest street in the metropolis. There seems only one difficulty—where are the carriages to stand on the great days of the Academy Exhibition?

The Atlantic Telegraph is again before the public as a speculation. This time the experiment will be fairly tried. No precautions that experience and science can dictate will be wanting. It will afford in the shares offered to the public a lottery of the least exceptionable kind, very grateful to those respectable individuals who dare not back a horse at long odds, or take a hand at chicken hazard or unlimited loo, and yet are gamblers at heart. Nature will be served. The spirit of gambling is rife amongst the most pious and the most respectable, who never bet and never touch a card. The annals of many mining companies prove this. The Atlantic Telegraph unites the excitement of a lottery with the sensation of doing something patriotic and philanthropic. The end of July will give us the fate of the greatest cable ever laid in sea or on land. If it holds for a year, we shall have a new one every year. As for its results, they are beyond calculation; but the first will be to encourage a company to lay down a cable in shorter lengths, with less long sea risks, and by a more circuitous route. The scheme for travelling by Spain and its islands to Africa, creeping along the coast, and on to South America by Brazil, will find patrons. The former Atlantic Telegraph attempt was nothing but a stock-jobbing bubble; this has had all the help that all the telegraphic science and unlimited means could afford.

What is to become of our Woods and Forests is a question that will probably be canvassed by the next Parliament. We do not, in these days of foreign oak and ironsides, require an elaborate arrangement for growing British oak-trees. Mr. Caird has made it abundantly clear that it will not pay the Woods and Forests to grub up timber-trees to make farms, for he showed that in Hainault Forest £67,000 were so laid out that it only pays common interest, and produces nothing for the fee-simple of the land, after destroying 2000 acres of beautiful woodland. As far as the finances of the Crown are concerned, the money spent on reclamation had better have been spent on a new estate, and Hainault left for pic-nic parties. Mr. Caird pointed out that as New Forest did not pay as a timber-growing investment, if it was to be disforested the most profitable way would be to sell it in small estates, when its picturesque qualities and vicinity to London would bring a good price, irrespective of the value of the land. Thus the forest would be preserved, and the treasury of the Crown benefited. As it is, the deer are gone, and the waste, in consequence of the want of judicious regulations, does not even breed good ponies. Mr. Caird must try in the next Parliament to get some support from "the friends of the people" in a comprehensive scheme for utilizing New Forest into a region of mansions and villas, and preserving the wilds of Epping for the Londoners. The Woods and Forests, with its surveyor at £8000 a year, is a tempting morsel for modest reformers, who do not care to touch grand politics.

The decisions which have been given in the Vice-Chancellor's Court, in the case of the Conservators of the River Thames *v.* the Mayor and Corporation of Kingston; and in the Court of Queen's Bench, in the case of Regina *v.* the Company of the Bradford Navigation and their Lessees, seem to have been designed to throw still more uncertainty than previously existed, as to the right of pollution of the water-course of a valley. In the first of these cases, the Vice-Chancellor laid down the principle that a Corporation was entitled to throw into the stream the same amount of impurities which it already found there; and he held that until the nuisance was proved to have been increased, there was no reason for calling for the interposition of the court for restraining the Corporation from the execution of the works that it might think proper to undertake. It would appear that the Vice-Chancellor regarded the question as one of degree, he only appears to have thought of the increase of the nuisance; but evidently this must open the door to a vast amount of litigation, for it will always be possible to dispute about the amount of impurity that is cast into the water-course either one way or the other. The refusal of the Vice-Chancellor to interfere with the proceedings of the Corporation of Kingston also appears to us to be a tacit avowal of the incompetency of his court to deal with any part of this question; but the decision of the Court of Queen's Bench, in the second case, places the rights and duties of the guardians of the public health on a somewhat better footing, though it is still doubtful what remedy the lessees of a canal company would have against the Corporation, that might so pollute the waters they were entitled to take as to expose them to be indicted for a public nuisance if they resorted to them. The effect of the last decision is clearly to establish the responsibility of the canal proprietors, so far as regards the purity of the water that they may take for the supply of their navigation. This is very good, as far as it goes; but the hardship of the decision lies in the fact of one source of supply being thus cut away from the canal proprietors, whilst they have little or no claim against the public body by whom that source has been fouled. According to the decision of the Vice-Chancellor, they have a remedy at common law; but that always depends upon their being able to prove that the impurity that is complained of has been sensibly increased by the act of the Corporation. The whole question of water-rights and privileges, in fact, requires careful examination, now that the progress of modern science has introduced the disturbing element of the water-closet system into the question.

Sir G. Grey seems to have been much impressed with the importance that the pollution of our rivers is likely to assume, even if it must not be said to have already done so. He has issued a commission for the purpose of inquiring into the whole bearings of the case; but, with the usual fate of the Whig Government, he has elected about the worst men that he could have done for the purpose. Mr. Rawlinson, Mr. Way, and Mr. Harrison, assisted by a barrister, in the person of Mr. Geoffry Lushington, are no doubt very able men; but they are not such as would inspire any confidence in those that they would be likely to interfere with in the discharge of their duties. Mr. Rawlinson and Mr. Way are too much compromised by their expressed opinions on the disposal of sewage. Mr. Harrison is comparatively unknown. Surely Sir G. Grey could have found some other men whose names would have given weight to the recommendations they might be disposed to make, or to have given importance to the suggestions they might think proper to utter with regard to the alterations in the laws affecting this class of property! In the meantime the evil is daily growing, and the pollution of our water-courses is daily increasing. It does seem odd that the men who took eight years before they completed their report upon the sewage of towns should have been selected to report upon this subject, which is still more urgent, and the decision upon which is still more imperative.

We will call attention, whilst upon this subject, to the proceedings in the Court of Queen's Bench, in the case *ex parte Rawson v. the Local Board of Health of Hitchin*, not so much because it illustrates one of the failures of the old Board of Health, as because it shows that there is little faith to be put in the financial arrangements to be by them undertaken. Mr. Rawson brought his action against the Hitchin Board for the pollution of the stream, and after several phases of the law he recovered a verdict of damages for the sum of £125. The Board, however, were indisposed to pay, and they therefore extinguished themselves by resigning; and the present proceedings of that body are obliged to be carried on under the authority of the Act 21 & 22 Vic., c. 98, which provides for the nomination of a receiver, who is empowered to make a rate for the payment of the just debts of the Board. It is rather singular that Mr. Rawlinson should have been the engineer who designed the works at this identical place, Hitchin; they were executed in the palmy days of the Chadwickian reign, and have not been much talked of lately by their somewhat garrulous author. Perhaps the experience gained in this manner, in the pollution of a river-course, was one of the determining motives of Sir G. Grey in the nomination of this gentleman upon the commission alluded to.

WATER CONSUMPTION IN MELBOURNE.—According to a statement made in Parliament the other day, the quantity of water consumed in Melbourne and the suburbs every 24 hours is 9,750,000 gallons, being at the rate of 90 gallons per head per diem, or a larger consumption per head than takes place in any other city in the world, save Rome, Marseilles, and New York.

Circular to Gas Companies.

We have on several occasions advised the City gas companies to deal liberally with the public, while maintaining their legal rights, and to attend in due time to the signs of discontent exhibited in various directions. The proposed reduction of 6d. per 1000 feet at Christmas next has failed to satisfy the public, and what were looked upon as mere temporary ebullitions, excited by imaginary grievances, have at length assumed a form that threatens to lead to a contest of greater magnitude, and embracing a more extensive range, than the memorable one which terminated in the passing of the Metropolis Gas Act of 1860. The citizens of London have special grievances to allege, for, having possessed the privilege of being supplied with gas at a cheaper rate than their neighbours, they suddenly found their position reversed, and the Act that was intended to benefit the gas consumers of the metropolis in general, was applied in their case to justify an increase of price at a time when in some other districts it was about to be reduced. There were other aggravating circumstances which rendered it particularly desirable that careful attention should have been paid to the complaints of the gas consumers in the City, and the experience of 1849 and 1850 ought to have been sufficient warning to the gas companies not to neglect them. Petitions from the inhabitants of several wards were presented to the Commissioners of Sewers and to the Court of Common Council, urging the adoption of measures to ensure the supply of better gas at a lower price. The petitions were referred to the General Purposes Committee, who made their report at the meeting of the Court of Common Council, held on Thursday last, which will be found in another part of our present number. The report embodies the six recommendations of the special Gas Committee of the Commissioners of Sewers, the last one of which is, that application be made to Parliament for a modification of the Metropolis Gas Act, so far as it affects the City of London, with the view of obtaining gas of a higher illuminating power and greater chemical purity at a cheaper price. The General Purposes Committee go beyond the special Gas Committee in further recommending that, should the Commissioners fail in their endeavours to benefit and protect the public, the Court of Common Council should consider the propriety of providing the means for constructing works, laying down pipes, and undertaking the manufacture of gas for the citizens. The recommendations proposed the imposition of conditions on the gas companies which they could not reasonably comply with, and will be generally considered sufficiently strong in other respects; but they were not strong enough to satisfy Mr. Dresser Rogers, who is impatient of delay, and moved as an amendment—"That the report be referred back to the said committee, with "instructions to confer with the Law, Parliamentary, and City "Courts Committee, to consider the best method of pro-"ceeding, at the earliest possible period, with an application to "Parliament to empower the Corporation either to purchase "the existing mains, plant, and works, in or supplying the "City of London, and to contract for the supply of gas into "those mains, or to erect works, and enter into the manufac-"ture and distribution of gas to the consumers, as is now so "successfully carried on by the corporation of Manchester, and "other towns."

The speech of Mr. Rogers in supporting the amendment shows clearly that he had been crammed for the occasion by studying the publications and remarks of Mr. S. Hughes and his *confrères*, and that if the Common Council follow his guidance, they will be led into a boundless sea of expenditure, in the delusive attempt to obtain that which the citizens of London have already within their reach, if they will only put into operation the protecting provisions of the Metropolis Gas Act. Mr. Rogers, it appears, would reduce the capitals of the companies on which dividends are paid to the valuation price of their present works and mains; he would raise the standard of illuminating power from 12 to 16 candles; he would have the gas "entirely pure," it being, as he said, "a "well-known fact" that gas entirely free from every kind of impurity is being supplied in the provinces, and by the South Metropolitan Company. Other large towns in England manufacture their own gas with advantage—then why should not the City of London? asks Mr. Rogers. He admits that it is not desirable, as a general principle, that corporations should become trading bodies, yet gas and water are exceptional instances; and, in dealing with those commodities, local authorities might depart from the principle that holds good in all other things. He "had it from good authority" that gas might be supplied into the mains at 1s. per 1000 feet, and he asserted that he had an estimate, "prepared by a person well versed in the matter," which showed that, assuming a capital of £250,000 to be required, gas might be supplied at 3s. per 1000 feet with a large profit, the profits of the London gas companies being exorbitant, even after the most fabulous deductions for expenses. These were the grounds on which Mr. Rogers recommended the Court of Common Council to become traders in gas; and, visionary as they are, they proved sufficiently substantial to carry the unanimous concurrence of the Court to the resolution. The injustice of the principles for which Mr. Rogers contends, and the fallacy of his alleged facts, scarcely require exposure in our columns; and, though there was no opposing vote to the adoption of the amendment, we may fairly presume that there were many members of the Court present who would object to carrying the object of the resolution into effect. Mr. Haines, the chairman of the committee, indeed, pointed out very forcibly some of the many practical objections to an attempt by the Corporation to undertake the supply of gas, and we shall, for the present, direct attention only to those points. If the Corporation were to purchase the existing mains and service-pipes, as proposed by the amended resolution, they would still have to contract with the companies for filling them with gas. If, on the other hand, it were determined to erect works of their own, there is no practicable site for such works nearer than Bow; and a special Act of Parliament would be required, not only to enable the Corporation to purchase the site, but to empower them to lay down mains from Bow to Whitechapel; and the Bill would be most strongly opposed by the gas companies. Supposing those difficulties overcome, a determined competition would be raised by the existing companies immediately the Corporation began to supply gas, to prevent losing any of their customers. The cost of the parliamentary contest, the great outlay on the works, the amount of which could not be less than one-third of the capitals now invested by the three gas companies, and the severe competition to which the Corporation would be subjected would effectually prevent the supply of gas by the Corporation from being successful. Taking this practical view of the subject, and without entering into the consideration of the various illusive advantages represented by Mr. Rogers, the chairman of the General Purposes Committee came to the conclusion that an attempt to supply gas by the Corporation would never answer. Why it should answer in one town and not in another there are numerous reasons, which we need not now repeat, for the objections noticed by Mr. Haines are sufficient to prove that in the City of London at least there are many obstacles to success that did not exist in places where the plan has prospered.

Whether an earlier concession of the long-delayed reduction of the price of gas in the City, which is now promised to take effect at Christmas next, would have prevented the present state of feeling against the gas companies may be doubtful, but it seems evident that it is not at present sufficient to appease the wordy storm raised by the advance in the price of gas after the passing of the Metropolis Gas Act. To give additional impulse to the movement, a meeting is about to be held in Guildhall to consider the subject of the gas supply of the City, on which occasion most probably Mr. Flintoff and other agitators for cheap gas will repeat their customary calumnious attacks on gas companies, and endeavour to confirm the assertion of Mr. Rogers, that gas can be supplied to the mains at the rate of 1s. per 1000 feet. It is to be hoped, however, that the citizens of London have more sound sense than to be misled by such misrepresentations to adopt a course of proceeding that must necessarily be attended with an enormous expenditure of money, from which they cannot receive more benefit than they might now gain by putting into efficient operation the powers they already possess to remove any real grievance they may suffer from the gas companies. Advertising engineers, hybrid contractors, and pseudo capitalists, itinerant agitators and adventurers recently emerged from Whitecross Street, may find it to their advantage to keep alive the spirit of hostility that now unfortunately prevails, and to urge recourse to extreme measures; but the citizens and gas consumers of London will, we trust, in their cooler moments, reflect on the consequences of involving themselves in a formidable parliamentary contest to attain an object which the chairman of the Committee of General Purposes,

who has well considered the subject with a view to their interests, has declared will never answer.

The thought of the bill at the end often casts a passing gloom over the brightest moments of the revel; but when the end comes, and the money is paid, some satisfaction is felt from the consideration that it purchased a few hours of pleasure in this "melancholy vale," as Burns calls it. No such comfort, however, alleviates the present condition of the members of the Stroud Local Board, who are called on to pay the costs of the proceedings in their endeavour to obtain the confirmation by Parliament of the provisional order authorizing them to borrow money to establish gas-works in Stroud. The money has been spent without adding a moment's enjoyment to their lives, and they have now to pay the bill without knowing where the money is to come from to enable them to do so. The position of affairs is fully set forth in the report we publish of the proceedings at the last monthly meeting of the board, when it was proposed to make a rate to include the expenses of the contest. The amount of claims was stated at £434. 12s. 10d., from which it is hoped to obtain an abatement of £45. The clerk of the Local Board claims the lion's share of the amount, his charges being £118. 14s. 7d. Counsel come next for £105. 16s., and the engineering witnesses claim the same within three shillings. The item for parliamentary agents is the moderate sum of £59. 18s. 1d., and the expenses of local witnesses amount to nearly the same. It appears to have been represented at the time it was resolved to apply for a confirmation of the provisional order, that £100 would cover all the expenses, and one member magnanimously promised to pay them out of his own pocket; but the cheque for the amount is not forthcoming when wanted, and it seems very doubtful whether the Local Board can legally make a rate for the purpose. They are in this position. The borough of Stroud includes an extensive district that is not lighted with gas, and it was distinctly stated to the parliamentary committee that the expenses of the application would be charged only on the lighted district. The clerk of the board, indeed, said at the last meeting, that he had at one time considered that the rate to pay the expenses would, "as a matter of course, be "charged on the lighting district only." It appears, however, that it is not competent to the board to constitute a sub-district for the purpose, therefore it was proposed to make a rate including the whole district; thus charging those ratepayers who are situated far beyond the area lighted with expenses incurred exclusively on behalf of the latter. Such a rate there is good authority for stating would be illegal, and could not be enforced. A case bearing closely on the question came before Lord Campbell and three other judges, in the Court of Queen's Bench, in November, 1857—*Bailey v. Cuckson, and others.* It was an action brought against four members of the Worksop Local Board of Health to recover £21. 14s. for attending and giving evidence before a committee of the House of Commons on a gas Bill. The defendants were present at a meeting of the board when a resolution was passed, authorizing their clerk to oppose the bill of the gas company. The plaintiff was summoned by him as a witness, and subsequently sent in his claim to the board, who made a general district rate to defray that and other charges; but the rate was quashed, on the ground that some of the expenses had been illegally incurred. Thereupon the plaintiff took proceedings against four members of the board individually. He was non-suited in the County Court, but the non-suit was set aside by the Court of Queen's Bench.

With this responsibility hanging over them, the members of the Stroud Local Board may be excused for feeling somewhat exasperated, and to that feeling must be attributed many of the remarks of Mr. Holloway, the "outfitter," who, it may be remembered, told the parliamentary committee that he considered the recommendation in the letter from the Home Secretary, communicated through Mr. Tom Taylor, to be "a "piece of impertinence." Some parts of his speech were so monstrously absurd that it might be supposed he was joking, were it not that he evidently considers the position of the Local Board to be no joking matter. He said the expenses that had been incurred were entirely attributable to the gas company, for if they had allowed the board to do as they liked, and obtain power to compete with them in the supply of gas, or to manage their affairs in accordance with the views of the board, there would have been no expenditure of money, and consequently the company ought to pay the costs. He still threatens not to let the matter rest, but he considerately offers terms to the gas company to which if they accede harmony may be restored. Those terms comprise a reduction in the price of gas to 4s. per 1000 feet, the lighting of the town at a still lower rate, with average meter indication, and the payment of their "little bill" in Parliament. If the company will not come to terms, he is armed with an offer, signed "Tom A. Hedley, civil engineer," to erect the necessary works for supplying 6 million feet of gas per annum, on the condition of being paid by yearly instalments of £312, continued for 21 years. By that ingenious device of the contractor and capitalist it is proposed to bring into operation the power which the board legally possesses to construct gas-works without the necessity of borrowing money. Mr. Holloway is evidently reckless in the utterance of undigested thoughts, and what he said respecting the change which the visit of Dr. Paine to Mr. Tom Taylor had produced in that functionary's opinions, must have been uttered in haste without any consideration; but, at all events, it requires to be retracted.

The perplexing embarrassment of the Local Board was mercilessly exposed by Dr. Paine. He pointed out the progress, step by step, by which they had become involved, regardless of the interests of the ratepayers; scattering abroad at the same time charges against the gas companies which when they were before the parliamentary committee they did not bring forward a tittle of evidence to support. He did not spare the Gas Committee for having concealed the correspondence with the Home Secretary till they had made their own use of it, nor the conduct of the board in proceeding with their wasteful expenditure of the public money, in direct opposition to the remonstrance of the Secretary of State himself. He did not fail to advert to the fact that the gas company, when they went before Parliament for their Act, frequently offered to confer with the board for the insertion of clauses for the benefit of the gas consumers, but their offers were declined, and he twitted those members of the board who had volunteered to pay the expenses of the application to Parliament, but who are now only anxious to throw the burthen on the ratepayers. Most persons acquainted with the facts of the case will concur in his indignant exclamation—"It is disgraceful "that the time of the public and this board, and the rate-"payers money, should be squandered, when you have nothing "whatever to comptain of, and never attempted to substantiate "your charges." Dr. Paine strongly denied the legality of a rate levied for the purpose of paying the expenses of the application to Parliament, which he contended the board would never be able to enforce, and he moved the adjournment of the rate for a fortnight, that there might be a larger meeting, and more time to examine the accounts. The clerk of the board appealed to them to relieve him from the unpleasant state of responsibility in which he is placed. "I hope you will do "something," he piteously said, "because I am the unfortunate "person who will be come upon;" but the meeting, regardless of his appeal, agreed to Dr. Paine's motion for adjournment, and thus the matter rests.

We are glad to perceive that the Imperial Gas Company have given notice of their intention to reduce the price of gas supplied in their extensive district to 4s. per 1000 feet from the 1st of July next. The company had entered into an engagement with the opponents of their Bill in the House of Commons to make that reduction if they obtained their Act; but the rejection of their Bill by the House of Lords relieved them from that obligation. The directors have nevertheless determined to give the public the benefit of the promised reduction. In the discussion on the Bill it was not sufficiently apparent that the main object was to enable the company to erect works on the Hackney Marshes, near Bow, and that the construction of the new works there would have prevented the necessity of extending the works at Fulham. Now, however, that the power to construct new works has been refused, the company will be compelled to increase those at the Fulham station to the utmost limits of the land they possess, of which they have a few acres still available. The opposition of the Bishops, therefore, will have the opposite effect to that which they intended, for in a crowded gas-work the same precautions to avoid nuisance cannot be adopted which a more open space affords.

Most of our readers will recollect that at the hearing of the appeal of the Phœnix Gas Company, at the West Kent Sessions, against an assessment of their pipes in the parish of Lee, a case was granted to the Court of Queen's Bench, and

considerable interest has been felt by many gas companies, whose assessments have been, as they contend, unfairly increased, whether the court would confirm the allowance for meters, retorts, trade fixtures and utensils, as part of the capital of the "hypothetical tenant," who is in such cases conjured up to represent one who never existed. The parish officers have, however, we are informed, abandoned their intention to carry out the matter further, on account of the weakness of the evidence in their case in regard to the special points on which the opinion of the Court of Queen's Bench was required. They have determined, it seems, to bring the question again before the sessions on another rate, and to strengthen their case with additional evidence, in the expectation that they shall thus be able to sustain an assessment equal to that on which they failed on the last occasion.

As we purpose reprinting in our next number the share-lists of gas and water companies, we earnestly request the assistance of our readers in rendering them as correct and complete as possible by their returning, on or before July 3, the slips issued with our present number, so as to enable us to rectify any errors and fill up the omissions of the list published on Jan. 10 last; and that special advice may be forwarded to us of any changes that may have taken place in the paid-up capitals, dividends, or value of shares, of which notice has not already been transmitted to us. Attention to these are the more urged as numerous corrections reached us after the publication of the last list, which would have been duly made had they been sent in sufficient time.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1576.—Lieutenant-Colonel James Baker, M.A., of Croft Lodge, Cambridge, for "*Improvements in machinery for obtaining power when fluid pressure is employed.*" June 9, 1865.

1586.—John Edgar Poynter, of Glasgow, manufacturing chemist, for "*Improvements in purifying paraffin.*" June 12, 1865.

1591.—John Thomas, of Battersea, London, for "*A new material to be used in the purification of heating and lighting gases.*" June 12, 1865.

1653.—Prospero Carlevaris, of Genoa, Italy, professor of chemistry, for "*Producing a light applicable to photographic purposes, to lighthouses, and to other illuminations.*" June 20, 1865.

1655.—Edward Griffith Brewer, of 89, Chancery Lane, London, for "*Improvements in the construction of taps or valves.*" A communication. June 20, 1865.

1658.—John Scholl, of 41, Berwick Street, Soho, London, for "*Improvements in gas-burners.*" June 20, 1865.

1667.—Michael Henry, of 84, Fleet Street, London, for "*Improvements in apparatus for measuring fluids.*" A communication. June 21, 1865.

1674.—Edward Kenworthy Dutton, of Sale, in the co. of Chester, merchant, for "*Certain improvements in apparatus for measuring and indicating the flow of liquids.*" June 22, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1364.—Fielding Fletcher, of 15, Fordrough Street, Birmingham, plumbers brass-founder, for "*Improvements in water-closets.*" May 17, 1865.

1370.—William Richard Williams, of Northumberland Court, Charing Cross, London, gas engineer, for "*Improvements in dry gas-meters.*" May 18, 1865.

1424.—John Ambrose Coffey, of 17, Gracechurch Street, London, consulting engineer, for "*Improvements in the retorts used in the manufacture of gas, and in other distillations, which improvements are adaptable to evaporating vessels.*" May 25, 1865.

1458.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in apparatus for measuring gas and other fluids.*" A communication. May 27, 1865.

1507.—William Clark, of 53, Chancery Lane, London, engineer, for "*Improvements in the means of carburetting or treating aëriform fluids for lighting and heating purposes, and in apparatus for the same.*" A communication. June 1, 1865.

1516.—John Nuttall, manager of the works of James Nasmyth and Co., Bridgewater Foundry, Patricroft, near Manchester, for "*Improvements in valves for steam and other fluids and liquids.*" June 2, 1865.

1527.—Charles Taylor, of Birmingham, machinist, for "*Improvements in tube-cutters and screw-stocks.*" June 3, 1865.

1548.—Henry Hermann Kromschroeder and John Frederick Gustav Kromschroeder, both of 14, Church Road, Haverstock Hill, for "*Improve-ments in dry gas-meters.*" June 6, 1865.

1549.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in the construction of reservoirs for containing and storing petroleum and other oils.*" A communication. June 6, 1865.

1553.—James Howarth, M.D., of Andover, for "*An improved method and apparatus for distilling coal, shale and other carbonaceous substances.*" A communication. June 7, 1865.

NOTICES TO PROCEED.

285.—George Henry Pierce, of Meavy, in the co. of Devon, for "*An improved socket for pipes, and method of joining the same.*" Feb. 1, 1865.

342.—Romain de Bray, of Rennes, in the department of Ille et Vilaine, France, for "*An improved reflecting apparatus for street and other lamps.*" Feb. 7, 1865.

408.—Edward John Cowling Welch, of Harrow, engineer, for "*Improved apparatus for supplying, with a constant and regular pressure, air to burners for consuming or burning hydrocarbons for illuminating purposes.*" Feb. 13, 1865.

436.—George Tyrrill Humphris, of Church Street, Walton-on-Thames, pump-maker and engineer, for "*Improvements in pumps, and apparatus for working the same.*" Feb. 15, 1865.

451.—Richard Smith, of Cumming Street North, Pentonville, London, for "*Improvements in treating sewage, and in arranging apparatus in sewers and culverts to facilitate the ventilation of such structures.*" Feb. 16, 1865.

478.—Joseph Cliff, of Wortley, near Leeds, fire-brick manufacturer, for "*An improvement in the utilization of the waste gases of blast furnaces.*" Feb. 20, 1865.

945.—John Richardson Wigham, of Albany House, Monkstown, Dublin, gas and lighthouse engineer, for "*Improvements in the means and apparatus employed for illuminating lighthouses.*" April 4, 1865.

1058.—Charles Forster Cotterill, of Cannock, Stafford, gentleman, for "*Improvements in pipes for conveying water and gas, and for other like purposes, and a new or improved composition for joining the said pipes, and other similar purposes.*" April 13, 1865.

1191.—Julian Bernard, of Lincoln's Inn Fields, London, gentleman, for "*Improvements in apparatus for raising water and other fluids, and in raising and lowering such apparatus.*" April 28, 1865.

1549.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in the construction of reservoirs for containing and storing petroleum and other oils.*" A communication. June 6, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1692.—George Rydill, "*An improved hydraulic pump or engine for raising liquids and obtaining motive power, also applicable for the ventilation of mines, and other useful purposes.*" June 5, 1862.

1718.—John Keeling, "*Improvements in apparatus for the manufacture of gas.*" June 9, 1862.

1722.—Arthur John Joyce, "*Improvements in lighting and heating.*" June 9, 1862.

1733.—John George Appold, "*Improved apparatus for regulating the discharge of water and other liquids, and air and other gases.*" June 10, 1862.

1749.—Auguste Aimé Lerenard, "*A new and improved cement or mastic for making joints of steam, water, or gas pipes, or chambers.*" June 12, 1862.

Parliamentary Intelligence.

HOUSE OF LORDS.

Monday, June 12.

The Tunbridge Wells Water Bill was brought from the Commons, read a first time, and referred to the Examiners.

The Gomersal Gas Bill was returned from the Commons agreed to.

The Rhyl and District Water; the Belfast Gas; the Carnarvon New Water; and the Gainsborough Water Bills, were returned from the Commons, with the amendments agreed to.

The Ayr Water Bill was returned from the Commons agreed to, with amendments. The said amendments were considered, and agreed to.

The West Bromwich Improvement Bill was reported, with amendments.

The Belfast Water Bill was read a second time, and committed to a Select Committee, consisting of the Earl of Stradbroke (chairman), the Earl of Ducie, Lord Foley, Lord Hatherton, and Lord Leigh, who will meet on Thursday, June, 15, at eleven o'clock.

Petitions were deposited against the Belfast Water Bill, from John Rea;—against the Highbridge Markets and Gas Bill, from the Trustees of the Bridgewater Turnpikes;—and against the Manchester Corporation Water Bill, from the owners, &c., of cotton-mills, &c., in or near Stockport.

Petitions were deposited from the Municipal Commissioners of Carrickfergus and others, and from the Marquis of Downshire, praying to be heard against alteration in the Belfast Water Bill.

Thursday, June 15.

The Chairman of Committees informed the House that the opposition to the Manchester Corporation Water Bill was withdrawn.

The Exeter Gas Bill was returned from the Commons, with the amendments agreed to.

The Torquay Gas Bill was read a second time, and committed.

The West Bromwich Improvement Bill was read a third time, with the amendmends, passed, and sent to the Commons.

The Cheltenham Water Bill was reported from the Select Committee, with amendments.

A petition was deposited by Lord E. G. F. Howard, praying to be heard against alteration in the Manchester Corporation Water Bill.

Friday, June 16.

The Manchester Coporation Water Bill was reported, without amendment.

The Crays Gas Bill was reported, with amendments.

The Ripon Local Board of Health Bill was read a third time, and passed.

The Commons amendments to the Leamington Gas Bill were considered, and agreed to.

Monday, June 19.

The following Bills received the Royal Assent:—The Local Government Supplemental (No. 3); Liverpool United Gas; Ross Improve-

MENT; GOMERSAL GAS; KIDDERMINSTER, STOURPORT, AND BEWDLEY WATER; RHYL AND DISTRICT WATER; BELFAST GAS; CARNARVON NEW WATER; GAINSBOROUGH WATER; AYR WATER; HASTINGS AND ST. LEONARDS GAS; GLOSSOP WATER; EXETER GAS (No. 1); RIPON LOCAL BOARD; and LEAMINGTON GAS.

The CHELTENHAM WATER Bill was read a third time, with the amendments, passed, and sent to the Commons.

TUESDAY, JUNE 20.

The MERTHYR TYDFIL LOCAL BOARD OF HEALTH; the NEATH WATER; and the SOUTHAMPTON WATER Bills, were retured from the Commons, with the amendments agreed to.

The BELFAST WATER BILL was reported from the Select Committee, with amendments.

The SOUTHPORT IMPROVEMENT Bill.—The Qneen's consent signified, and Bill reported specially, with amendments.

The MANCHESTER CORPORATION WATER Bill was read a third time, and passed.

The CRAYS GAS Bill was read a third time, with the amendments, passed, and sent to the Commons.

THURSDAY, JUNE 22.

The WEST BROMWICH IMPROVEMENT Bill was returned from the Commons, with the amendments agreed to.

The TUNBRIDGE WELLS WATER; the BROMLEY GAS; and the OLDHAM BOROUGH IMPROVEMENT Bills were read a second time, and committed.

The TORQUAY GAS Bill was reported, with amendments.

FRIDAY, JUNE 23.

The HIGHBRIDGE MARKETS AND GAS Bill was read a second time, and committed to a Select Committee, consisting of the Duke of Richmond (chairman), Lord Abercromby, Lord de Tabley, Lord Mostyn, and Lord Wenlock, who will sit on Monday, June 26, at eleven o'clock.

The CHELTENHAM WATER and the CRAYS GAS Bills were returned from the Commons, with the amendments agreed to.

The BELAST WATER and the SOUTHPORT IMPROVEMENT Bills were read a third time, with the amendments, passed, and sent to the Commons.

A petition was deposited from the owners, &c., of property in Carrickfergus against the BELFAST WATER Bill.

SATURDAY, JUNE 24.

The TORQUAY GAS Bill was read a third time, with the amendments, passed, and sent to the Commons.

HOUSE OF COMMONS.

MONDAY, JUNE 12.

The HASTINGS AND ST. LEONARDS GAS Bill.—The Lords amendments were agreed to.

The LEAMINGTON GAS Bill was read a third time, and passed, with amendments.

TUESDAY, JUNE 13.

The GLOSSOP WATER Bill.—The Lords amendments were agreed to.

The BROMLEY GAS and the OLDHAM BOROUGH IMPROVEMENT Bills were read a third time, and passed.

WEDNESDAY, JUNE 14.

The EXETER GAS (No. 1) Bill.—The Lords amendments were agreed to.

FRIDAY, JUNE 16.

A petition was presented from the Corporation of Sheffield, praying for alteration in the WATER-WORKS Bill.

MONDAY, JUNE 19.

The MERTHYR TYDFIL LOCAL BOARD OF HEALTH Bill.—The Lords amendment was agreed to.

The NEATH WATER and the SOUTHAMPTON GAS Bills.—The Lords amendments were agreed to.

TUESDAY, JUNE 20.

A message was received from the Lords, to the effect that they had agreed to the MANCHESTER CORPORATION WATER, the CHELTENHAM WATER, and the CRAYS GAS Bills.

FRIDAY, JUNE 23.

The CHELTENHAM WATER and the CRAYS GAS Bills.—The Lords amendments were agreed to.

Legal Intelligence.

COURT OF EXCHEQUER.

FRIDAY, JUNE 16.

(Sittings in Nisi Prius, after Trinity Term, before Baron BRAMWELL *and a Special Jury.)*

BEALE *v.* NEWTON.

Mr. MONTAGU CHAMBERS, Q.C., Mr. C. W. WOOD, and Mr JOYCE appeared for the plaintiff; Mr. HUDDLESTON, Q.C., and Mr. T. JONES were for the defendant.

This was an action to recover damages for the publication of a libel. The plaintiff is an estate agent, carrying on business at 209, Regent Street, and has for some time past taken an active part in the proceedings of the vestry of St. James's, Westminster, of which he is a member. At one of the meetings of the vestry he delivered a speech, in which he criticized certain views and measures of the Metropolitan Board of Works, and which was subsequently published and circulated in the form of a pamphlet. On the 30th of November last the contents of the pamphlet were brought under the consideration of the Mile End Vestry, and became the subject of a lengthened discussion. In the course of the debate the defendant, who is a member not only of the vestry, but of the Metropolitan Board of Works, made a speech in which, after stating that he did not intend to impugn the motives of the plaintiff, and that he believed him to be quite honest in his intentions, he proceeded to review and refute his views, and terminated with the following observations, which were mainly relied on as the foundation of the libel:—

Such are the charges that have been made. If there were more time I could go more fully into them; but I think I have said sufficient to show, by the selection of several of them, how falsely they are made, and on what slight foundation they rest; and that, when examined by the light of facts and of reason, there is not a tittle of truth or justice in them. On the contrary, I believe they are made maliciously and for a very bad purpose. Of course, Mr. Beale refers to the vexed question of the utilization of sewage; and, if there were time, I think I could show how that question lies at the bottom of all the opposition and vindictiveness we have seen exhibited. I have been asked who Mr. Beale is. You will best understand who he is when I say he is the same gentleman who was associated with a Mr. Hughes on the gas question a few years ago. We have no particular reason to place confidence in him on that account. The result of his misguided efforts on that occasion was to increase the price of gas in this district from 4s. to 4s. 5d.; and he, and those who were associated with him in that matter, obtained from the Metropolitan Board a sum amounting, I believe, to £5000, which was made a charge upon the ratepayers, as their expenses in the agitation in obtaining the bill which did so much for the gas companies of London. And the Mr. Hughes who was associated with Mr. Beale in that matter is the Mr. Hughes who is now acting for Mr. Ellis in the sewage scheme. At the bottom of all these charges rests, I believe, this question of the sewage. Mr. Hughes is Mr. Ellis's engineer; Mr. Beale was Mr. Hughes's colleague; and, in consequence of the board not having favoured the scheme of Mr. Ellis, all these persons seem to be banding themselves together for the purpose of throwing as much dirt on the Metropolitan Board as they can. I believe this is at the bottom of all the charges, and I believe the duty of the vestries and boards of the metropolis, if they have any respect at all for representative government, is to support the Metropolitan Board.

The debate, with this speech, was afterwards published in the *East-End Observer*, of which the defendant is proprietor. An apology having been required and refused, the present action was brought.

The speech having been proved and read, Baron BRAMWELL suggested that the matter should be arranged.

This led to a consultation among the counsel, at the end of which,

Mr. HUDDLESTON said Mr. Newton was ready to state then, as he had previously done, that he did not impugn the honesty of Mr. Beale's motives, and that his only object was to convince him by argument of the fallacy of his views.

Mr. CHAMBERS said that after this retraction and apology his client would at once adopt his suggestion, and withdraw a juror.

The learned JUDGE said that the course which the case had taken was a most proper one. The speech appeared to him not only temperate, but able, and he had heard it read with great pleasure. It contained some harsh expressions, but they were qualified by subsequent explanations, and he did not see that there was anything of which the plaintiff could seriously complain.

A juror was then withdrawn.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

COURT OF COMMON COUNCIL, THURSDAY, JUNE 22.

At a Meeting of the Court, at Guildhall, this day—the Right Hon. the LORD MAYOR in the chair—the following report by the General Purposes Committee, which had been printed and circulated among the members, was brought up for consideration:—

To the Right Honourable the Lord Mayor, Aldermen, and Commons of the City of London in Common Council assembled.

We whose names are hereunto subscribed, of your Committee for General Purposes, to whom it has been referred to consider the undermentioned petitions, viz.:—

On the 17th of November, 1864;—Of inhabitants of the ward of Aldgate, praying the court to assume and undertake the supply of gas to the consumers within this City, and that the necessary application may be made to Parliament for powers to do so, and to abolish the present unsatisfactory and inefficient system of supply:

On the 8th of December, 1864;—Of inhabitants of the ward of Cripplegate, relative to the supply of gas, and praying the court to take such steps as may be deemed advisable for the relief of the inhabitants from the injurious monopoly under which they now suffer; that the supply may be increased, the prices lowered, and the quality improved:

Of inhabitants of the ward of Portsoken, for the court to supply gas to the consumers within this City, and that the necessary application may be made to Parliament for powers to enable the corporation to do so, and put an end to the very unsatisfactory, expensive, and insufficient supply:

On the 9th of February, 1865;—Of inhabitant ratepayers of the ward of Farringdon Within in ward meeting assembled, for the interference of the court to put an end to the existing monopoly created by the "Sale of Gas Act, 1860," either by the repeal of the same or the exemption of the City of London from its operation; and failing the success of such interference that the court will apply for parliamentary powers, by which the corporation may be enabled to deal with so important a question to the interests of your petitioners by undertaking, if necessary, the manufacture and distribution of the gas within the boundaries of the City, whereby so essential a commodity be secured of a good quality and at a moderate price:

Of the inhabitants of the ward of Farringdon Without in ward meeting assembled, praying that the court will take all measures necessary to get a repeal of the present Acts of Parliament which relate to the supply of gas in the City, and that the corporation shall take measures to obtain an Act to take the whole management into their own hands for the benefit of the entire City, provided they are unable by their present powers to do it:

Of the inhabitants of the ward of Bishopsgate, for the consideration by the court of the question of gas supply to the City of London, and to take such measures as will secure to this City a better and cheaper supply of gas than at present, and, by an application to Parliament, obtain the control of the pipes, so as to obtain an efficient supply to the consumers.

Of inhabitants and ratepayers of the ward of Castlebaynard in wardmote assembled, praying the court to take measures to remedy the deficiency in the quantity of illuminating power and purity of the gas supplied in this City, and to adopt means to enable the corporation to have the supply in its own hands.

On the 9th of March, 1865;—Of the inhabitants of the ward of Langbourn in wardmote assembled, respecting the supply of gas within the City, and urging the court to take immediate steps, through Parliament or otherwise, to protect them in future from the anomalous and unsatisfactory position in which they are now placed:

do certify, that we have been attended by deputations representing the several petitioners, and having heard them at length in explanation of their views and opinions, we have entered upon the subject with that careful consideration which its importance suggests, as connected with the interests of our fellow-citizens.

The use of gas having become so general, two material points have naturally from time to time been urged by the consumers—viz., the purity and illuminating power of the gas; and next, the price that should be charged for it.

The Commissioners of Sewers have, in the discharge of their duty, frequently investigated the subject as connected more particularly with the public lighting of the City; but we conceive that, in the references to us, the question is raised as affecting the personal interests of the citizens.

Either view, however, points to the same result, and we were therefore of opinion that considerable advantage would be derived from conferring with the Commissioners of Sewers. Our request for this purpose being readily complied with, we have discussed the subject with their special committee on gas, and have had our attention particularly drawn to a report recently presented by them to the Court of Sewers, and to a joint report upon the subject from the engineer and medical officer of health.

As we entirely concur in the recommendations of the special committee, it is right that we should refer generally to the statements embodied in the reports mentioned, and which are so comprehensive as to embrace the various phases of the question from the original introduction of gas into the City.

The companies engaged in the supply of gas to the City are

The Chartered Gas Company, incorporated in 1810.

The City of London Gas Company, in 1817.
The Great Central Gas Company, in 1850.

Prior to 1823 the first two companies competed in the supply; but in that year, under an Act of Parliament, the City was divided between these two companies, and, as a necessary consequence, a monopoly created.

By the repeated action of the Commissioners of Sewers, the price of gas, which was originally 15s. per 1000 cubic feet, was gradually reduced to 6s., which was the charge in 1847. Investigation, however, proved that even this amount was, under circumstances, far above a reasonably remunerative price, and the failure to induce the two companies to make a further reduction, led to the organization of the third company above mentioned—viz., the Great Central Company, who, with the countenance and support of the City, obtained in 1851 their Act of Incorporation; and in the result gas was supplied to the citizens at 4s. per 1000 cubic feet.

This continued until 1860, when, on account of a previous action on the part of the gas companies surrounding the City, and with a view of reinstating the principle of districts (which prevailed before the establishment of the Great Central Gas Company), and thereby stopping competition, certain proceedings occurred in Parliament, and the Metropolis Gas Act was passed. Under this Act the three companies supplying the City raised the price of gas to 4s. 6d.; and notwithstanding a contract entered into by the Great Central Gas Company, and dated the 12th of February, 1850, to supply at a price never to exceed 4s., and to be reduced, under certain circumstances, to 3s., the company were successful in proving their legal right, under the authority of the Act of Parliament, to increase the charge to 4s. 6d.; and this abrogation of the contract, it may here be stated, is estimated, as between 4s. and 4s. 6d. per 1000 cubic feet, to give an excess charge of £25,000 upon the private consumption of gas in the City.

But with regard to the gas itself: the deputations who have attended before us have agreed in stating that it is impure and deficient in illuminating power. This statement is supported by the observations in the commissioners report. A standard of purity is prescribed by the Metropolis Gas Act, and though, in many provincial towns, a far higher chemical purity is now maintained, Dr. Letheby reports that the prescribed standard for the City has scarcely ever yet been attained, excepting recently by the City of London Gas Company.

As to the illuminating power of the gas, it would appear to be the general opinion that it is even less than it was before the passing of the Metropolis Gas Act, though this Act provided a minimum power which appeared to be for the advantage of the citizens.

Without going further into details, we believe that the complaints of the petitioners are borne out by results of inquiry, and the great question therefore arises, what remedy shall be applied? And upon this point we have again every satisfaction in endorsing the conclusions of the Commissioners of Sewers; and though we feel that the action of the corporation would, at all events, under present circumstances, be *limited*, whilst that of the commissioners is *general*, there is a unity of purpose which suggests the great desirability of co-operation in action; we beg, therefore, to quote the recommendations of the special Gas Committee, and to ask the authority of the court for this committee to act with the commissioners, in endeavouring to carry out such measures, founded upon the said recommendations, as will tend to answer the reasonable expectations of the citizens.

As a concluding remark, it will be satisfactory to the court to state that, during the proceedings which have hitherto been taken, letters were received from the companies, stating that they intended reducing the price of gas to 4s. at Christmas next.

RECOMMENDATIONS OF THE SPECIAL GAS COMMITTEE.

1. That an offer should again be made to the companies for the commission to undertake the lighting, extinguishing, cleansing, and the entire charge of the public lamps, affixing meters to every twenty lamps, or thereabouts, and adopting such other precautions as will ensure a fair average consumption.
2. That the companies be requested to affix, at their expense, governors or regulators to the whole of the public lamps.
3. That the further assistance of the police be, if possible, obtained in the supervision of the public lighting.
4. That all legal measures to secure to the citizens gas equal to the Act of Parliament standard of illuminating power and chemical purity should be resorted to.
5. That an application be made to the Secretary of State for the Home Department, to institute inquiry as to the capitals of the several companies, and for the purpose of securing to the consumers all the advantages contemplated by the Metropolis Gas Act, 1860.
6. That after mature consideration of the subjects referred to us, we are of opinion that it is inexpedient at the present time to take measures with the view to the commission manufacturing and selling gas; but that application be made to Parliament for a modification of the Metropolis Gas Act, 1860, so far as it affects the City of London, and especially with the view of obtaining for the citizens gas of a higher illuminating power, of greater chemical purity, and at a cheaper price than that now supplied, and such other powers as may be beneficial to the ratepayers and gas consumers in the city.

We further agree in the opinion expressed by the commissioners that, should the commission fail in its endeavours thus to benefit and to protect the public, it should be a recommendation to your honourable court to consider the propriety of providing the means for constructing works, laying down pipes, and undertaking the manufacture of gas for the citizens.

All which we submit to the judgment of this honourable court. Dated this 26th day of April, 1865.

Mr. HAINES, the chairman of the committee, in moving that the court do agree with the report, said he had hoped, after all the labour and trouble bestowed upon this question, the citizens of London would ere this have been supplied with better gas at a cheap rate. There were three gas companies existing in the City, but, unfortunately, they were districted, and the public were thereby debarred from the benefits of fair competition. It was true that notice had been received from those companies of an intended reduction of price next Christmas, but he did not think, from all the information he had been able to obtain, that the cost of manufacturing gas justified so high a charge as would even then be made for the article. Many suggestions had been made to the committee, and, amongst others, it had been proposed that the corporation should undertake the supply of the gas to the City, but there appeared to be obstacles in the way of carrying out the proposition. The Commissioners of Sewers had investigated the question of the supply of gas, and had had a report presented to them upon it by their medical officer; but when they came to deal with the gas companies, and seek to bring them under the provisions of the Act of Parliament, it was found that, owing to the fact of all the justices being members of the Court of Sewers, there was a difficulty in putting the law in force. That difficulty, however, would, he hoped, soon be remedied, as he observed upon the paper of business that a report was to be brought up from the special committee in relation to the constitution of the Court of Sewers, recommending that the names of four senior and four junior aldermen, who were not disqualified, should be omitted from the commission. There would thus be a sufficient number of justices in a position to adjudicate upon questions of difference which might arise between the public and the gas companies, and it was the intention of the commissioners and of the committee to look narrowly after the public interests in this respect. An honourable member (Mr. E. Dresser Rogers) had given notice of an amendment to the present motion, to refer the report back to the committee, with instructions to take steps for making an application to Parliament for power either to purchase the works and the mains of the existing companies, or that the corporation should be authorized to erect works of their own for the supply of the citizens with gas. To such a proposition there were, as he had stated, several objections. In the first place, if the corporation purchased the existing mains they must still go to the present gas companies for a supply of gas, seeing that by the Metropolis Act they had secured to themselves the monopoly of that supply in their several districts. On the other hand, if the corporation desired to erect works of their own, there was no site they could oblain for the purpose nearer than Bow. They would require for that purpose a special Act of Parliament, not only to purchase a site, but to enable them to lay down mains through the various parishes between Bow and Whitechapel, and they might depend upon it that an application for such an Act would be opposed tooth and nail by the gas companies. And, supposing these difficulties overcome, they would, according to Mr. Haywood's report, require a capital of £200,000 to provide works for the supply of the City. But there was one point to be remembered, and it was one which, upon consideration, would give a better estimate of the probable cost of such an undertaking. The City of London was at present supplied by three companies—the City, the Chartered, and the Great Central—and the united capitals invested by these companies in their undertakings amounted to £1,403,195. Now, if they calculated that each of these companies was in a position to supply the City, it would be necessary to assume that if the corporation took the works into their own hands they would require at least one-third of that total capital for the purpose. The question he would therefore ask was, whether it was wise to pass such a resolution as that which Mr. E. Dresser Rogers intended to submit, and thus forestall their income, which, to a certain extent, was already being burdened with engagements to which they had committed themselves? He believed it was not, for, in his opinion, the supply of gas by the corporation would never answer. Immediately they undertook the work, competition would arise, for the companies who had spent £1,403,195 upon their enterprises would be willing to make any sacrifice rather than let the corporation take a portion of their profits. It would be remembered, too, that if, as proposed in the amendment, the corporation purchased the existing mains of the companies, there would still be the service-pipes into the houses to be taken; and when they had got them all they would have no security for a continuance of the supply of gas. The consumers were constantly changing, and though the present consumers might be willing to take gas of the corporation, their successors might return to the companies, and leave the corporation with but a very limited business. He felt, therefore, that it would not be prudent, at the present time, to attempt to interfere in that way with the existing arrangements. But whatever determination might be arrived at on this occasion, the committee would continue to exert themselves to secure for the citizens a better supply of gas at a lower rate. It would be seen by a reference to their report that the Commissioners of Sewers, in whose conclusions the committee agreed, had endeavoured to make some arrangements with the gas companies in respect of the public lamps, but that they had been defeated, the companies refusing to supply gas by meter, unless a meter were attached to every lamp in the City, which would entail a most unwarrantable outlay, whereas one meter in 10 or 20 lamps, as suggested by the commissioners, was amply sufficient. Under all the circumstances of the case, he thought the court could not do better than agree with the committee in their report.

The motion having been seconded,

Deputy FARRAR said he thought it only fair to state that since this matter had been in agitation, the officer whose duty it was to test the quality of gas supplied in the City, had from time to time reported that there was a considerable improvement in this respect, and that the gas now was above the requirements of the Act of Parliament.

Mr. E. DRESSER ROGERS moved the following amendment:—"That the report be referred back to the said committee, with instructions to confer with the Law, Parliamentary, and City Courts Committee to consider as to the best method of proceeding at the earliest possible period with an application to Parliament for an Act to empower the corporation either to purchase the existing mains, plant, and works in or supplying the City of London, and to contract for the supply of gas into those mains, or to erect works and enter into the manufacture and distribution of gas to the consumers, as is now so successfully carried on by the corporation of Manchester and other towns." He said he trusted the members of that honourable court would distinctly understand that he did not in the slightest degree under estimate the importance of the steps which he recommended the corporation to take, or that he should have ventured to place that amendment upon the paper of business if some older member had undertaken the duty. And, moreover, he desired it to be clearly understood, that he did not at all underrate the labours of the committee in reference to this question. But when he saw, as stated in their report, that many of the important wards in the City had presented memorials to the court, supporting those memorials by the attendance of influential deputations from the inhabitants, asking the corporation to interfere in the present unsatisfactory state of things, and to take upon themselves the manufacture and supply of gas to the citizens, he felt encouraged to hope that the amendment he had just read would receive their careful consideration. The substance of the various memorials was, that the gas as supplied by the companies was bad in quality, and charged at too high a price. The principle upon which he started was, that both gas and water were articles of consumption so necessary to the comfort and convenience of the inhabitants of a large commercial city, that they were lifted out of the category of ordinary trading speculations, and ought not to be made entirely matters of pecuniary consideration. The committee in their report shrunk from recommending the corporation to undertake the supply of gas, and suggested, rather, that an attempt should be made to obtain redress by an amendment of the Metropolis Gas Act, 1860. What was that Act? It was an Act which at first was framed by certain parties who knew what they were about, and if it had been passed in that form, it would have been of some service to the consumers. But when the promoters of it got into the House of Commons, they found the power of the gas companies was so great that they were unable to carry out what they desired, and they were obliged to accept the Act in the form in which it now stood, and which had made it an Act of immense advantage to the companies, but none at all to the consumers. It was entirely nonsensical and futile to talk of amending that Act. It would involve only the same trouble and expense for the corporation to get a fresh Act for themselves as it would to get any alteration in the Metropolis Gas Act. The question of the capital of the gas companies alone, as defined by that Act, was the most absurb thing possible. It was not the mere working capital required by each for the supply of their respective districts, but it was capital augmented by bonuses, by money invested in the erection of bad works, and by the expenditure of thousands upon thousands of pounds in former years, when the question of the economical construction of works was not properly understood. These moneys had been capitalized year after year; and, under the operation of this Act of Parliament the public were called upon to pay interest on that capital, which was enormously in excess of what was necessary for the supply of London with gas. In reality it was a fictitious capital, and not capital invested in the works strictly required for the purpose. The capital of the gas companies ought to be in the proportion of the rental which they could make from a given sum of money. The Chartered Company had now a capital of £314 for every £100 worth of gas manufactured; the Great Central had a capital of £347 for every £100 worth; and the City Company £445 for every £100 of gas made by them. Now, with capitals so fictitiously raised as these were, although there was a dividend clause and a maximum price in the Act of

Parliament, the public had no control over the proceedings of the gas companies. Outside of the City there was the South Metropolitan Company, of which he would say, if he were disposed to speak favourably of any gas company, that it was one of the best in the metropolis; the proportion of capital was only £298 for every £100 worth of gas made. And what was the consequence? In the district of that company the consumers were being supplied with gas, certified by the medical officer as of 13½ candles illuminating power, at 3s. 8d. per 1000 cubic feet. That was the effect of there being something like a proper proportion between the amount of capital expended and the amount of the gas-rental realized. The working of the Metropolis Gas Act was, therefore, entirely unequal in its operation, and it was not at all an Act for the advantage of the consumers. Then, as to the standard of quality prescribed by that Act. Why should the inhabitants of London now be told that they ought to be satisfied with 12-candle gas, when in the present session of Parliament the standard for many provincial towns was fixed at 16 candles? Why should London have gas of 8 or 10 candles illuminating power, as they knew it was in the street-lamps, when in Manchester the illuminating power was equal to 20 candles? Then, again, it was a well-known fact that in the provinces gas was being manufactured entirely pure; and even in the South Metropolitan district the gas was reported by the examiner, on the previous evening, to be free from every kind of impurity. Why should it not be so in the City? The truth was, the Metropolis Gas Act must be entirely repealed, and the corporation must go to Parliament for an Act giving them the power to supply the City. Other large towns in England manufactured their own gas with advantage. Why should not London? He had before him a list of 58 towns in Great Britain where, at the present moment, the corporations or other public bodies had the control of the gas-works, to the manifest advantage of the inhabitants. At Manchester, the corporation were supplying gas of 20-candle illuminating power for 3s. 2d. per 1000 cubic feet, and the profits enabled them to appropriate in aid of the rates £50,000 or £60,000 a year. But he remarked, in passing, that it was not altogether a question of price with the citizens of London in reference to the present agitation. He believed if the citizens were polled, it would be found that they were not so desirous to get gas at a low price as to get it of a fair and proper quality. Their trading operations and businesses as well as their health and comfort were suffering from the inferior quality with which they were now supplied. The case of Halifax was one of the most recent, and one of the best instances of a corporation having the management of the gas-works. The corporation there, purchased the works of the formerly existing company, and had since entirely renewed them as well as the mains, so that the price they paid the company was only to be regarded as the value of the goodwill. The capital the corporation had expended was £123,275, and their income from the works was £24,359. The expenditure was £14,599, so that there was a profit realized of £9760, being at the rate of nearly 8 per cent. upon the capital invested. And not only was this result obtained, but the public lamps were supplied with gas at 1s. 8d. per 1000 cubic feet, and the private consumers at prices ranging from 3s. to 4s., according to the quantity consumed. This was a practical illustration of what the corporation of London were called upon to do. At Walsall, too, where the works belonged to the town, the charge to the public lamps was 2s. 2d., to the large consumers 2s. 4d., and to others 2s. 6d. per 1000 cubic feet. It might be objected, and he knew it was sometimes urged out of doors, that corporations should not become trading bodies. Granted that as a general principle it was undesirable, he still thought that in the present case they were bound to seek for powers to purchase the mains in the streets and to erect works outside the City, bringing their mains, if necessary, along the railway bridges; or, having purchased the pipes, to contract with parties for the supply of gas into them. He had not taken the subject up without inquiry, and he had it on good authority, that gas could be supplied into those pipes at 1s. per 1000 feet. The companies had not always manufactured their own gas, but had entered into arrangements with contractors for supplying it into the gasholders. With reference to capital, the officers of the Sewers committee reported that £200,000 would be reqired for the supply of the City of London. Now, he would ask, was that amount a matter of much consequence to the corporation? Some few years ago, they invested £200,000 in railway shares. Was there any want of profit in the result? And was there any member of the court who, having examined the accounts of the gas companies, was prepared to state there would not be a considerable profit on such an investment in gas-works? At the present moment the profits of the three companies supplying the City were over £100,000 a year. He apprehended that the corporation were not so poor that they could not afford to invest £200,000, with a prospect of getting 15 or 20 per cent. upon it. If they were, he believed they could find plenty of capital for the purpose within a dozen yards of the place they were now assembled in. Assuming that one-third of the capital of the Chartered Company was required for the City, the united capitals of the three companies was £933,195, or £733,195 more than the report to the Commissioners of Sewers stated was required for the purpose—an excess upon which the citizens of London were paying interest in the shape of the high price charged for gas. He had before him an estimate which had been prepared by a person well versed in the matter, which showed that, taking a capital of £250,000, and supplying gas at 3s. per 1000 feet, they could realize a large profit; and he was prepared to substantiate his statement by the testimony of practical gas engineers. After referring to the prices charged for gas and the cost of coal in various parts of the country, the speaker proceeded to speak of the profits realized by the London companies, which, he said, were exorbitant, even after the most fabulous deductions for expenses, and, indeed, every means being taken so to spend their money that they should not be obliged to reduce the price of gas to the public. Returning to the expediency of the corporation engaging in the supply of the City, he said that apart from the consideration of the trouble and annoyance which the private consumers experienced through the existing arrangements, there was the consideration of the cost of the public lights. In the year 1825, the charge for the public lamps was £5. 5s. per annum, gas being then charged to private consumers at 15s.; in 1853, the public lamps were charged £2. 19s. 6d.; and in 1864, when private consumers were paying 4s. 6d. per 1000, the public lamps were paying £5. 9s. 6d., notwithstanding the great reduction in the price of coals which had taken place in the meantime. The total cost of the public lamps in 1853 was £8750, and in 1865 it was £15,700, the difference in the number of the lamps not by any means accounting for this large increase. On these grounds he thought the corporation ought to adopt the course he had recommended; and if it were objected that corporations ought not to become traders, let them go to Parliament and ask for power to sell gas without a profit, charging only the cost price of the article and such an additional sum as would leave a margin for redeeming the capital employed in the erection of the works. He believed that if they did so the House of Commons would be disposed to assist them in the discharge of this important public duty.

Mr. RUDKIN seconded the amendment, and said if the court adopted the course indicated in it they would be able, even if they did not succeed in obtaining power from Parliament to supply gas to the City, to force the companies into such terms as would be just and equitable to the citizens. He would rather that this question should be fairly and properly settled before a committee of the House of Commons, than that they should seek to obtain terms from the gas companies.

Mr. GLOVER said a deputation had recently waited upon the Lord Mayor to present a memorial, signed by some 2000 citizens, complaining of the present supply of gas.

The LORD MAYOR said he had granted the use of Guildhall for the purpose of holding a meeting to consider the subject in the early part of next month.

Deputy FARRAR said he believed there was but one opinion in the Court of Sewers in reference to the propriety of the course suggested by the mover of the amendment, and he quoted from the report made to the commissioners by their special Gas Committee in support of his opinion. The commissioners themselves would have adopted that course, but they felt they had no funds applicable to the purpose. The corporation had ample funds, which would be well applied in that way, and he hoped, therefore, that the amendment would be carried.

Mr. MEDWIN concurred in this view, and said it was evident from the report of the commissioners that they expected the corporation to take some such step. He hoped they would be unanimous on the subject.

Mr. PAYNE, as a member of the committee whose report was now under discussion, said he believed every member of that committee would receive with satisfaction the carrying of the amendment. If the committee had thought the corporation were ready to take so broad and comprehensive a view of the matter they would have been willing to recommend it.

The RECORDER then put the amendment to the court, and it was unanimously adopted, and on being put as the original motion, it was also unanimously carried, amidst loud cheers.

CITY OF LONDON COURT OF SEWERS, TUESDAY, JUNE 13th.

At the Meeting of the Comissioners of Sewers of the City of London, held this day—Mr. DE JERSEY in the chair.

Dr. LETHEBY laid before the court his quarterly report of the quality of the gas supplied to the City, as follows:—

To the Honourable the Commissioners of Sewers of the City of London.

Gentlemen,—I have to report that in the course of the quarter ending in May last, there have been 652 examinations of the illuminating power of the gas supplied to the City, and the results are that the mean illuminating power of the Great Central gas has been equal to 14·19 standard sperm candles, the Chartered gas to 14·13 candles, and the City gas to 14·26. During the whole of the quarter the illuminating power has been but once under the parliamentary standard, and that was in the case of the Great Central gas. In this respect, therefore, the quality of the gas has been very satisfactory; for it has been about 1 candle higher than it was in the corresponding quarter of last year, and 2 candles better than the Act requires.

The chemical quality of the gas supplied by the City Company has been almost invariably good. It has been at all times perfectly free from ammonia and sulphuretted hydrogen, and the average amount of sulphur in 100 cubic feet has been but 17·5 grains; and the parliamentary proportion of 20 grains has been exceeded only 7 times out of 59. The quantity of sulphur in the Chartered gas has also been generally low, for it has averaged only 19 grains in the 100 cubic feet; and it has exceeded the limits of the Act on 12 occasions out of 59; but the proportion of ammonia in the Chartered gas has always been excessive. The chemical quality of the Great Central gas has been good in two respects—namely, in the absence of ammonia and sulphuretted hydrogen; but the amount of sulphur in the gas has nearly always been above the quantity sanctioned by Parliament. It has averaged 23·7 per 100 feet, and it has failed to fulfil the requirement of the Act in this respect on 51 occasions out of 55.—I remain, gentlemen, &c.,

HY. LETHEBY.

RETURN *of the quality of the Gas supplied to the City of London during the Quarter ending Saturday, May* 27, 1865.

Illuminating Power,—Sperm 120 grains per hour.

	City Company.	Chartered Company.	Gt. Central Company.
Maximum	16·31	15·82	16·33
Minimum	12·13	12·42	11·60
Average	14·26	14·31	14·19
Total number of observations	217	217	218
Do. do. when under standard	none.	none.	1
Amount of Sulphur present (grains) per 100 cubic feet.			
Maximum	22·5	24·6	28·0
Minimum	14·2	13·0	10·5
Average	17·5	19·0	23·7
Total number of observations	59	59	55
Do. do. when in excess of standard	7	12	51
Pressure of the Gas in 10ths of an inch of Water.			
Maximum	2·8	2·7	2·7
Minimum	0·9	0·8	0·7
Average	1·4	1·3	1·46

It was ordered that the report be printed, and a copy to be sent to every member of this court, and of the Court of Common Council.

THE GAS QUESTION AT STROUD.

MEETING OF THE LOCAL BOARD.

The Monthly Meeting of the Stroud Local Board was held on Tuesday, the 6th inst., the chair being taken, in the absence of the chairman, by Mr. BUCKNALL.

The CLERK said he had to bring in an estimate for a new rate, but as this involved other matters, perhaps he had better read the following short report of the Gas Committee:—

The Gas Committee have to report that the provisional order has been rejected by the parliamentary committee, in consequence of the opposition of the gas company and 216 other persons, many of whom do not pay rates, and several neither reside in nor own property in the district. As regards the loan of the water-works, the attention of the Secretary of State has been called to the matter, and it is now under his consideration.

Dr. PAINE: May I ask what clever accountant has made out the analysis that is appended there? There is only one objection to it, and that is, that it is entirely untrue. I should have thought that after the wonderful analysis made once before, you had given up that sort of thing.

Mr. HOLLOWAY: On the part of the Gas Committee, I may state that we are sorry our application to Parliament has not been successful. We are more sorry that so large an expense has been incurred, but the ratepayers will have to thank the gas company for that expense, which is entirely attributable to them and their coadjutors. If this application of the board had not been opposed in the manner it was, the expense to the ratepayers would not have been sixpence, but that opposition has led to a parliamentary fight. I think it would have been very much more prudent on the part of the gas company to have let us obtain our order, and then have met us here, that the question in dispute might have been settled amicably. There would have been no difficulty whatever, if we had obtained our powers, for us to have met and settled all points in dispute without the erection of new gas-works. But this opposition has been started in the face of the town, and I may, perhaps, indulge in a little prophecy in saying that the question will not be finally settled until there are new gas-works erected, or a different

spirit exhibited by the gas company. With regard to what Dr. Paine says about the report being untrue, I can state that I have gone very carefully over the copy of the petition, and I find the signatures are composed of members of the gas company, and a large number of their relatives and connexions in business. It also comprises ratepayers living chiefly out of the lighting district, and there are on that petition something like 25 names of persons who really cannot sign their own names, and have to sign with a cross. Then there is a long list of paupers—not in the Stroud Union, but persons excused from the rates on account of extreme poverty, and numerous persons living entirely out of the parish, who neither hold property nor pay rates in it—such persons as Wise and Leonard, Roberts and Jowlings, Rollett of Rodborough, Hastings of Vatch Mills, and others. I ask what right have they to stand between the people and Parliament in this matter? It is a piece of impertinence on their part. But in order that the question may be finally settled and brought before the public, and that it may not rest upon my statement or Dr. Paine's, I intend publishing the list of names, so that people can judge for themselves who and what they are, and where they live, and what right they had to interfere. I did not intend to make any remarks to-day. I thought the question might have dropped through without further discussion as to the past, and that we might rather look to the future. As the question now stands, the Stroud Gas Company have won their first innings, but I think, if I understand the feeling of the town, that a very large majority of the townspeople are not inclined to quietly submit to this little check on the part of the gas company. Still the majority have no inclination to oppose the company, or be unfriendly, but simply as a matter of right and justice to set themselves straight, and not live under the stigma of being under the heel of a monopoly. I have in my pocket an application from a party who is prepared to erect gas-works for the town of Stroud. Before I read it, I think it is well I should say that I should be very glad, for one, to enter into some arrangement with the gas company to avoid all future fighting. I think it is a question that ought to be settled without prolonged agitation. I am quite tired of it myself, but still, as owners of property and ratepayers, we cannot rest to consider the matter settled so long as it is in its present shape. If the gas company are inclined to treat with us, I may just state what I believe will satisfy the town. I have ascertained the feeling of a great many, and I think if the company would consent to a permanent reduction of the price of gas to say 4s per 1000 feet—if they will light the town lamps by meter instead of the present system, at a reduction, of course, from the price charged on private individuals, to be fixed by the average allowed elsewhere; and, in addition to that, they may be expected to pay our little bill in Parliament.

Dr. PAINE: I suppose that is *meant* as a joke.

Mr. HOLLOWAY: It is no joke as far as I am concerned. Perhaps it is well to ask enough. At all events, upon some such basis as this, I think harmony may be restored. As to the payment of that little bill, it is not very extravagant, though more than we expected; but when we consider that the company was the real cause of this expense, it is not unfair that they should pay it. I will read you this letter, and ask you to put it on your minutes, that it may come on for discussion next time:—

To the Stroud Local Board of Health.

Gentlemen,—Presuming that the rejection of your application to Parliament for extending borrowing powers will not prevent your carrying out your intentions of erecting works for supplying the town of Stroud with gas, I beg to submit to your consideration an easy mode of payment for such works that would entirely remove the scruples of the most timid ratepayer, viz.: I will undertake a contract with you to erect the works in accordance with Mr. Hughes's estimate for supplying 6 million cubic feet per annum. The works to be erected under the supervision of your own engineer, and all necessary security given for the due performance of the contract on my part as to materials, workmanship, and efficiency. Payment to be made to me within 21 years, by 21 annual payments of £312; at the expiration of which time you will have been able to pay for your works out of profits on the gas supplied, and the gas consumers will have handed over, as a free gift, a very handsome property to the ratepayers. If you entertain this proposal I shall be happy to wait upon you personally to go into details and to discuss such propositions as may suggest themselves to you.

I am, gentlemen, your obedient servant,

TOM. A. HEDLEY, Civil Engineer.

28, *Poultry, London, E.C., 3rd of June*, 1865.

That is the proposition, and it will be for the members to get up the subject between this and the next meeting, so as to approach it with the facts well in their minds, and either adopt or decline the offer of Mr. Hedley. I will say that before the committee it was distinctly proved that we could supply the town at 3s. 6d. per 1000, and yet pay a profit. That statement was made by three engineers, one of whom had been entirely over the district and seen the nature of the consumption; and although this evidence was given before some very great engineers employed by the gas company, in cross-examination that part of their testimony was not shaken in any degree; so that it is quite plain the town of Stroud is at this moment paying 1s. per 1000 for its gas more than it ought to be paying. That 1s. is caused, as we believe—it has been asserted by competent persons, so that it is not mere guess or theory—entirely by the company being extended to the outlying villages. I conclude by giving notice that I will bring this on at the next meeting.

Dr. PAINE: What estimate do you propose as to this rate for the expenses?

The CLERK: We propose to make a rate this morning of 1s. in the pound all round.

Dr. PAINE: How much of that goes to these expenses?

The CLERK: Fivepence.

Dr. PAINE: Is that all? Will it include everything?

The CLERK: No; the fact is that before going into the estimate I had intended giving you some figures with regard to these expenses, in order that you might be better able to decide upon adopting the estimate. The bills, as they stand at present, are not regarded as final, because in the case of three or four of the larger sums, it is proposed to ask for considerable abatement, and I have taken instructions to write to the parties to ask them to reduce these figures. If reduced as we wish, those amounts will be £319. 12s. 10d.

Mr. SUTTON: The probability is you won't get them reduced. What is the difference between that and the amount charged?

The CLERK: There is a difference of about £45, the amount claimed being £434. 12s. 10d.

Mr. SUTTON: That is very different from the estimate given here. It was stated that £50 would be enough, and that £100 would cover everything.

The CLERK: I was away at the time, and I was sorry afterwards that that estimate had been given, because when I read it in the *Stroud Journal* I knew it was insufficient.

Dr. PAINE: I remember at the meeting in April Mr. Holloway stated that Mr. Kearsey had informed him the whole expenses would not exceed £100, that £5 would suffice for counsel's fee, that the witnesses would pay their own expenses, and that if people made any objection to the costs he would be prepared to pay them himself. I therefore thought that he would have brought a cheque here to-day, and so settled this troublesome question, which I am sorry is brought up again. My hope was that all we had to do with it was to bury it decently, and let it rest; because if you are to rake it up again some of us may have to say more than will be altogether pleasant in regard to the proceedings of this board upon the gas question. When charges are made of the kind and character brought against the gas company, there are only two courses open to honourable men—either to prove them or withdraw them. You have made damaging charges which you have never proved or attempted to prove. They appeared in your memorials, in your speeches at the board, and in your applications to the Secretary of State, and yet out of your own mouths the parliamentary committee condemned you; for a weaker case was never presented, or a more ridiculous figure made by a public body before any tribunal whatever. It is disgraceful that the time of the public and this board, and the ratepayers money, should be squandered, when you have nothing whatever to complain of, and never attempted to substantiate your charges.

Mr. HOLLOWAY: What are those charges?

Dr. PAINE: For the last two years you have never missed an opportunity, either at this board or elsewhere, of charging the gas company with everything that was disgraceful and dishonourable, and now you coolly ask what are the charges? Then with regard to the proceedings of this gas committee the ratepayers have a right to complain. They never produced the correspondence till they had first made their own use of it, even to publishing extracts from it that were thought to be damaging to the gas company, and they set at defiance the bye-laws of the board, and even the express provisions of the Public Health Act. If this correspondence had been made public, as it ought to have been, and properly discussed and well considered here, I believe the common sense of this board would have prevented this wasteful expenditure of public money—an expenditure undertaken in direct opposition to the advice and remonstrance of the Secretary of State himself. Then at last this committee had the impudence to tell the parliamentary committee that they were in London representing the Stroud Board of Health, and offered to consent to the insertion of a clause which would have thrown the cost of this competing gas scheme on the lighting district alone, though they knew very well that the Act of Parliament only allowed the mortgage of the general district rate. Fortunately for the public, your witnesses proved their opponents case, and the parliamentary committee never got far enough for the insertion of clauses. We never objected to your having your own gas-works, but we do object to your doing it with the ratepayers money. Do it with your own money, and you have as much right to go into the market as we have. But your committee has all along been making charges——

Mr. HOLLOWAY: Will you name the charges?

Dr. PAINE: Amongst other things you said the quality was bad and the price high, and the supply short. But in London you never produced a single witness to prove it.

Mr. HOLLOWAY: Because we were advised by counsel that it was of no use to go back to the past, or we could have brought the whole town to prove that they were true. You know very well that your gas was the worst in all England.

Dr. PAINE: I know the direct contrary.

Mr. HOLLOWAY: It is true. It was not fit for people to live in, and dangerous in dwellings and factories. It was only fit for the streets.

Dr. PAINE: You had a crowded and unwholesome and ill-ventilated place, and then you put it down to the gas.

Mr. HOLLOWAY: It is all very well that you who are a member of the gas company should complain of danger to your vested rights; but we are fighting for the rights of the inhabitants.

Dr. PAINE: Who has been fighting for the poor people, who have to pay this £434?

Mr. HOLLOWAY: I say you caused that by your opposition.

Dr. PAINE: If you had paid proper attention to these letters of the Secretary of State you would never have come to this.

Mr. HOLLOWAY: I say that the Secretary of State, through Tom Taylor, became—for some reason which you, perhaps, can explain—the friend of the gas company. He made a delay of a year first of all, and then he makes that evidence against us. I believe he behaved most inconsistently towards us. He first made an order granting what we applied for, and immediately afterwards began to oppose the execution of it, from the time that he was seen by the gas company, as you know.

Dr. PAINE: I know the direct contrary. You have stated this before, and there is not a shadow of ground for it. The history is as simple as possible. The only question ever asked Mr. Tom Taylor was what course Parliament would take with the bill last year—whether it was too late to put in an opposed order or not—and he replied that it was too late. I went up to London and saw Mr. Taylor myself on this subject, and saw no one else, and that was the only communication made to him on the part of the gas company.

Mr. HOLLOWAY: Well, it made a great impression on him, for he has been against the board ever since.

Dr. PAINE: When we went to Parliament, you know perfectly well that when our bill was printed, a copy was sent to the chairman and the clerk, and they were distinctly asked if they wished to have any clauses inserted for the protection of the town. I believe they were also informed that we had prepared draft clauses, and should be happy to meet them and discuss the subject if they were anxious to do so. It was only when this board declined all communication that we took those clauses out at the last moment.

Mr. HOLLOWAY: I have no doubt the gas company would have been very much obliged to us to have done it, because they would have had another ground of opposition.

Dr. PAINE: The gas company were anxious to confer with your committee for the benefit of the ratepayers and consumers generally, and repeatedly offered to do so, but you declined; and if you had thought your charges capable of proof, then was the time to have proved them. We went for our own Act. We had all our accounts and all the proceedings of the company for 30 years before the committee. We were told on good authority that it was a more trying ordeal to go before Lord Redesdale than to go before any other committee with an opposed bill. We satisfied all Lord Redesdale's requirements, put ourselves under parliamentary restrictions as to price and quality and capital, and yet were told the other day in town that our capital was understood to be £6000.

Mr. BLAKE: What a pity you were not opposed.

Dr. PAINE: What a pity you did not oppose us.

The CLERK: You said you would oppose our rate if we spent it in opposing you.

Dr. PAINE: We said nothing of the kind; but I tell you now that you are about to make an illegal rate, and one you will never be able to enforce.

Mr. HOLLOWAY: Very well, we will try that on, and if you refuse to pay we will have your furniture. The town will decide who is right.

Dr. PAINE: The town has already expressed an opinion.

Mr. HOLLOWAY: It was dishonourable to get the poor people to sign that petition. The gas company has lugged them into this expense.

Dr. PAINE: The company has fought their battle, and the ratepayers are beginning to find that out. You declined to risk your own money in this competition, but proposed to make the poor ratepayers partners in the scheme. They are already overburdened; surely they have a right to be heard on such a question as this.

Mr. HOLLOWAY: The company is the enemy of the town of Stroud.

Dr. PAINE: It is a pity you could not persuade the committee so; that was your time to do it.

Mr. HOLLOWAY: So we should, but for your illegal petition.

Dr. PAINE: If it was illegal it was for you to have shown it.

The CLERK: I hope you will do something, because I am the unfortunate person who will be come upon.

Mr. HOLLOWAY: The board is strong enough to enforce its rates.

Dr. PAINE: I have a strong opinion to the contrary.

The CLERK: I have three or four opinions, all agreeing that we have power to make a rate and collect the money. I do not think it would be prudent to make the rate above a shilling.

Dr. PAINE: The whole amount of those expenses ought to be got in before you attempt to make an estimate.

The CLERK: The rate must be made within six months, and if we do not make it now it will interfere with the next rate. I propose to put £350 into this rate.

Mr. SUTTON: Will this be charged on the lighting district or the general district?

Mr. HOLLOWAY: A subscription list was started by the promoters of this scheme, and the expenses would unquestionably have been paid by private subscription had the thing been successful; but it has been thought since that as the opposition, extending over the district, defeated the intentions of the board, it was quite right and fair that these persons who opposed should also have the pleasure of paying their part of the expenses, and that it should not all fall to the share of the individuals who wished to do some good.

The CLERK: With reference to Mr. Sutton's question, over what area the rate should be charged, I thought for some time that it would, as a matter of course, be charged upon the lighting district only; but when I looked at the Act of Parliament, I found that a very great doubt would be raised as to the legality of charging it upon the lighting district only, and for these reasons: The application was to obtain power to borrow money upon mortgage, and the mortgagees would be such upon the rates of the whole district. If works had been erected and profits made, those profits would have gone to the benefit of the whole district; and that is a stronger reason still, because where the benefit is there should be the burden. Therefore it would not be legal to charge the burden upon one part of the district, and confer the profits upon the whole. Then as the profits would go to the district generally, I do not know that it would be competent for the board to make a sub-district for such a purpose. When you do make a sub-district you must charge your expenses where the benefit is conferred, and not certainly on a smaller district.

Dr. PAINE: Is it not almost a pity that was not thought of before you pledged yourselves before the committee, the other day, to charge the whole expense upon a sub-district, when you knew perfectly well you had no power to do so?

Mr. HOLOWAY: No; if we had got our bill, we should have charged it upon the capital of the works. If the clause had been inserted and passed, we should have had no rate to make at all; the ratepayers would not have been called upon for a penny.

The CLERK: If we had got that passed, of course it would have been an Act of Parliament.

Dr. PAINE: Unfortunately the committee did not get far enough into the matter. Well, I am very sorry this has come up again, for I did not intend to have said another word about it. I am sure the town must be tired of it.

Mr. HOLLOWAY: Wait a bit; you don't know the town.

Dr. PAINE: If you had had a private consumers company, the gas company would not have opened their mouths to oppose it.

Mr. BLAKE: The company threatened us with opposition.

Dr. PAINE: Why I and the chairman both said at this board that a private company was the right thing. I should like to see these bills.

The various accounts for fees, expenses, &c., were produced, and were as follows:—

Messrs. Durnford and Co.	£59	18	1
Counsel's fees	72	14	0
Ditto	33	2	0
Mr. Witchell's bill	118	14	7
Mr. R. Grist	4	0	0
Mr. G. Holloway	4	0	0
Mr. Blake	7	0	0
Mr. W. Holmes	7	0	0
Mr. Bragg	3	0	0
Mr. Bateman	7	0	0
Mr. Baker	13	17	6
Mr. Coley	9	5	3
Mr. S. Hughes	36	8	0
Mr. T. A. Hedley	28	17	6
Mr. Stevenson	40	7	6
Mr. S. Wilkinson	1	1	0

The CLERK observed that they had been treated very badly by counsel, who, after taking a good fee, never attended the second day at all, but took a consultation fee of £5. 5s. to say he should not be able to come; and they had to get another copy of the brief and another counsel the second day.

Dr. PAINE remarked that Mr. Hope Scott, who was engaged by the company, did not personally attend, and said these charges appeared to be very reasonable. He did not want to be misunderstood in anything he said, because it was often said he represented the gas company. He was not speaking for the company, for he had had no consultation with them; and he did not know that they would, as a company, take any steps to oppose this rate. He was speaking simply as a ratepayer, and giving his own opinion, which was backed by high legal authority.

Mr. HOLLOWAY: They like to fight behind other people's backs.

Dr. PAINE then proposed the adjournment of a rate for these accounts for a fortnight, in order that they might have a larger meeting and more time to examine the accounts.

The CLERK opposed it on the ground that it would embarrass the action of the board, and it was not proposed to pay the money to-day.

Mr. HOLLOWAY asked what was to be gained by it.

Dr. PAINE said one thing was, the accounts would then be complete, which they were not now, and it was a serious question, which had better be discussed fully before a larger meeting. If the rate was opposed, there would be still more expense, so that they had better consider it carefully. He had given them warning before, and he gave them warning now, that it would be desirable for the board to see their way clearly before they took any further steps.

Mr. HOLLOWAY: We have power to pay our own rates, and we shall not be stopped from making a rate because some cantankerous gas proprietor says it is illegal. If so, we may as well shut up shop, and go home at once.

Mr. SUTTON thought it desirable that the chairman of the board should be present; and the CLERK urged that he should not be left in the lurch as to the payment of these accounts.

The board then divided on Dr. Paine's proposition for a fortnight's adjournment. There were four for and three against it, and the adjournment was accordingly carried.

BRITISH ASSOCIATION OF GAS MANAGERS.

WEDNESDAY, MAY 31.

After the opening address of the President, as reported in our last, Mr. E. S. CATHELS, of Shrewsbury, read the following paper:—

ON GASHOLDERS AND THEIR TANKS AND CONNECTING-PIPES.

The purport of this paper is to present a brief *résumé* of the successive improvements which have been effected in the construction of the gasholder up to the present time, and to submit to the notice of this meeting a scheme of the writer's, which he believes to be a further improvement therein. It consists of a novel arrangement of the connecting-pipes and valves, by which the number of valves usually employed is diminished, and one pipe into the holder will serve all the purposes of two pipes, as heretofore used.

In the attempt to trace up the improvements which have been made in the gasholder, we incidentally obtain some insight into the prejudices and difficulties which had to be encountered and overcome by those interested in the introduction of gas lighting, as we are necessarily carried back to the time when it was first put in practice; and a dreadful time it seems to have been. It has been humorously described as a kind of scientific "Reign of Terror," when those engaged in the establishment and management of gas-works were looked upon as a species of revolutionists, meditating nothing less than the termination of society, and when public meetings were held to oppose and denounce the impending igneous anarchy.

As the use of gas, however, gradually extended, and people discovered that the pipes were, after all, not red-hot, and that gas might be introduced into a house without either setting fire to it or blowing it up, they soon got the better of their groundless alarm. But for long after they had ceased to regard the mains as latent volcanoes, and the—at that time literal—gun-barrel service as more dangerous than when originally connected to stock and lock, they still continued to have a great dread of the gasometers (as they were then called), which were believed to be as dangerous as so many powder magazines, liable at any moment to explode, and deal forth death and destruction to all around. And I am not quite sure that even after half a century's experience to the contrary, so firmly rooted had this delusive fear become, that it is yet entirely eradicated from the public mind.

It is not to be wondered at, then, that in the general belief in the imminent danger of such vessels there should have been a desire to lessen the supposed danger, by curtailing their size. But it is a matter of astonishment that certain members of the Royal Society, who were deputed by Government to inspect and report upon the safety, or otherwise, of the Chartered Gas Company's Works, at Westminster, should not only have participated in the vulgar frenzy, but should actually have had the folly to recommend, in addition to restricting the size of the holders, their being incased in strong buildings. If the contents of the holders had really been of such an explosive nature as these *savants* supposed, it is evident that the "strong buildings" would have been about as effectual in restraining the force of the explosion as old King Canute's chair when placed on the sea beach was in controling the tide; and was, therefore, as a measure of pre-precaution, like adding grape or canister to a charge of gunpowder. This absurd recommendation was nevertheless adopted and enforced by Government, and the Chartered Company was in consequence put to the expense of making small holders, and surrounding them with substantial buildings.

But after a time the erection of buildings over the holders was abandoned, Mr. Clegg, in spite of the popular belief in the necessity of such a precaution, leading the way by the erection of holders in the open air at Birmingham and Chester. Buildings incasing gasholders have, it is needless to say, long disappeared, as a rule, in this country, though I know a gas-work where one still remains in all its primeval glory, covering a holder of some 30,000 to 40,000 feet capacity; and, but that it would be a rather cumbersome relic, it would, I think, be not an uninteresting contribution to the British Museum.

Gasholders, with the exception of one or two unsuccessful attempts to construct them on different principles, have from the first been inverted cups or vessels, guided by some kind of framing, and working in a tank of water as at present. But it appears they were not always made cylindrical, some in the early days of gas lighting having been made of the square, and some of the oblong form. The first of these attempts to obviate the necessity of a tank of a depth equal to the height of the holder, was a vessel having a rotary or revolving motion, erected and in action at the Chartered Gas-Works for a few years; and the other was an equally impracticable device, termed the "collapsing gasholder." The principle on which the revolving gasholder acted I cannot attempt to explain, for I confess I never fairly understood it; but the principle of the collapsing one was simple enough. It consisted of a triangular-shaped vessel, having the lower edges of its sides and ends immersed in a shallow tank of water. The sides were made to close together like a pair of bellows; but as the hinge parts of it must have been of leather, or other flexible material, it is evident that it would soon get leaky and unfit for use. Both these contrivances were the production of the fertile brain of Mr. Clegg, but neither, as it proved, were destined to add to the list of his valuable inventions in gas engineering.

But by far the most ingenious and feasible effort to solve the problem of how to increase the capacity of the holder, without increasing the diameter or depth of the tank, short of the telescope gasholder itself, was that for which a Mr. William Stratton, of London, took out a patent. "One of the objects he had in view," he stated, "was the doubling of the capacity of the gasholder without increasing the dimensions of the tank, in works where it might be requisite, for want of room, to turn it to the best account." The description of this holder, or rather double holder, is minutely given by Peckstone, but without the aid of drawings would not, following his description, be readily understood. Suffice it to say, that it consisted of two holders, one within the other, the inner being slightly less in diameter than the outer one. The inner holder was of a height equal to the depth of the tank, the same as a single holder, and the outer one was twice the height of the inner one. The gas space was between the tops of the two holders, the inlet and outlet pipes rising between the sides of the two holders, which were bulged out to give room for the pipes, and the holders were connected by chains in such a way that when full of gas the inner one was at its greatest depth, and the outer one at its greatest height. When the outlet-valve was

opened the outer holder descended in the usual way, and as it descended the inner one was pulled up, and pushed the gas out. Altogether the plan was not only quite practicable, but was a very ingenious and beautiful contrivance. But the effectual solution of the difficulty was, as we all know, reserved for the application of the telescope principle to the gasholder, an invention at once so simple and yet so perfect that the vessels so constructed work in every respect as easily and beautifully as single vessels do; and, but for the cost of the extra framing, to secure the holder against the effects of the wind, in consequence of their increased height, there is no reason why the principle should be restricted, as it usually is, to one cup and two lifts. That the principle can be so extended in case of need is proved by the holders at the City works of London, which are so conspicuous objects of attraction from the river, and which are literally, as well as metaphorically, towering monuments of the engineering skill displayed in their construction, and of the importance of gas lighting as an art and a social necessity. I have never seen it stated to whom the world is indebted for this invaluable invention, and shall be glad to obtain the information from some gentleman present.

While on the subject of the telescoping, or cupping of the gasholder, it may be proper to notice here an important improvement in the construction of, the cup, by rolling it into the required shape out of a single sheet of iron and so dispensing with the riveting otherwise necessary, which has been adopted in many instances for some years past with great success.

Reverting again to the single-lift holder, it may be worth while to briefly notice a scheme that was invented by Mr. John Malam, of Hull, with the object of dispensing with the external columns and framings. It consisted of a vertical column fixed to the centre of the bottom of the tank, which guided the holder by means of a concentric cylinder of the same height as the holder, and to the circumference of which it was secured by lateral stays. As counterpoising the holders was then the universal practice, the centre vertical column was made hollow, and the weights were placed inside of it. But it will be evident that as the holder had no external guiding it would be easily moveable by the wind, and the outer cylinder pressed against the inner one or column. This caused so much friction that, although the cylinder was made of thicker plate than the rest of the holder, it soon rubbed into holes and became leaky, a fatal objection in itself, and aggravated by the fact that there was great difficulty in repairing the cylinder, which could only be done from the outside. Several holders were erected on this plan, but they have all, so far as I am aware, long since disappeared, with the exception of one or two of small size still left among the cotton-mills in the north.

We come now to an epoch in the history of the gasholder when it may be said that a particular style—speaking architecturally—was established. The holders now erected were larger than those which had preceded them, and the size and general design almost identical all over the country. I mean the telescope holder of from 30,000 to 40,000 cubic feet capacity, and having double columns, bearing massive entablatures, placed at three equidistant points of the circumference of the holder, and tied together by girders crossing over the top of the holder, and forming an equilateral triangle. They were, as a rule, constructed with strong internal framing, and were—and, I may add are still—very substantial structures, to the correctness of which description I dare say almost every gentleman present can testify, as there is scarcely a gas-work in the country of any magnitude which has not one or more of these holders in use. I may observe that there is a curious custom in the construction of these holders, the purpose of which it is difficult to understand—viz., that although the chains of the counterpoise weights of the *lower* lift pass over wheels placed in the usual way directly over where the chains are attached to the holder, two of those of the *upper* lift rise to wheels placed perpendicular to where they are fixed, and are then carried horizontally across the top of the holder, and all three chains pass over wheels placed side by side at one angle of the triangular top framing, instead of each passing over a wheel placed vertically to where it is attached to the crown of the holder, as in the lower lift. But this class of gasholder, it is superfluous to say, is gradually giving place to those of more gigantic dimensions, the ordinary system of framing of which we are all sufficiently familiar with to require any mention here. But I may be permitted to just further add that it is, I think, surprising that gas engineers should not avail themselves to a greater extent of the use of wrought-iron girders for gasholders, by which the requisite strength, with great lightness, would be secured, and at a cost exceeding little, if any, that of the heavy cast-iron ones so generally in use.

The attempt to enumerate even the more important improvements which have been effected in the gasholder must necessarily, in a paper like this, be somewhat cursory and incomplete; but although it had been made elaborate enough to include *all* the improvements which have been made in that important part of gas apparatus since the days when it left the hands of the "fathers of gas lighting," it would, after all, be but a rather meagre display if the telescoping of the holder were to be excepted. But it would be unfair to suppose that this reflects on the ingenuity of gas engineers.

The first cylindrical gasholders, like the first railroads, have proved to have been so perfect in their general principles, that little, it would seem, could be done to improve them. And just for the same reason that railroads have been, and continue to be, reproductions with little variation of the original Liverpool and Manchester line, so gasholders continue to be, more or less, copies of those first constructed, than which no more eloquent tribute could be paid to the genius of their respective inventors.

But if there be little dissimilarity in the principle of the vessels of former and recent construction, there is certainly a striking contrast in their size. The extraordinary and unforeseen extension in the use of gas as a domestic light has, as we have seen, necessitated a gradual increase in the capacity of the gasholders, until some of them have attained to truly colossal dimensions. Sir Humphrey Davy's ironical prediction of the dome of St. Paul's being converted into a gasholder has, in the sense he intended, been already far exceeded; and, indeed, if their dimensions continue to be enlarged at the same proportionate rate as they have been during the last few years, the size not of the dome merely, but of the cathedral altogether, may yet be equalled. What would the Royal Society gentlemen have said of the "Imperial leviathan" of London, which is 200 feet in diameter, and 80 feet in height, with a capacity of 2½ millions of cubic feet; or of the triple-lift one at Blackfriars, already alluded to, which towers to the extraordinary height of 105 feet.

But because the general principles of the construction of the gasholder may not be advantageously changed, we must guard against being so conservative as to sit quietly down with the belief that it is, as at present made perfection. Though we may not be able—using a political metaphor—to radically change with advantage its general constitution, we may be able to improve some of its details; and that this can be done I will now endeavour to show, which brings me at length to the more immediate object of this paper.

First, as to the all but universal custom of trussing the crown of the holder, to give the requisite convexity for throwing off the rain, &c., to prevent oxidation, I believe it could be very well dispensed with altogether, because I think there can be nothing better adapted for the purpose than the elastic force of the contained gas itself. That gasholders of large dimensions, as well as those of small size, can be so constructed with perfect safety, has I think been sufficiently proved. I had some years experience myself in the action of one so constructed, and it was in every respect just as good a gasholder as if it had been trussed, and from all appearance likely to be just as durable.

And next, with reference to the equally common dry wells—though many, by the way, sadly belie their title—I will make bold to say that they are in my opinion altogether unnecessary, and I know some engineers who have for years entirely abandoned them with perfect success. It will of course be necessary to except such instances as where the tank, and consequently the syphons, are at a greater depth, than that at which a pump at the surface of the ground will raise the condensation from the syphons; but it is rarely if ever the case that tanks are sunk to such a depth as that.

The only reasons, then, that I am aware of that can be urged for making a dry well are, the facility it affords for getting at the descending pipes, and the convenience of renewing the suction-pipes of the syphons, should that ever require to be done. Now these reasons, I am bound to say, appear to me to be very insufficient for the continuance of the practice. The descending pipes are no more liable to get out of order than are the ascending ones inside the holder, and therefore require no more facility for being got at, while the suction-pipes can be renewed if required, quite as easily without a dry well as with one. But the most conclusive answer to any arguments for the supposed necessity for a dry well is the fact that there is really not the slightest inconvenience experienced where it has been discarded. Unless, therefore, there be other and stronger reasons of which I am ignorant, I think one would be justified in expressing surprise that a custom so indefensible should still be so generally practised.

Another time-honoured custom in connexion with the gasholder, may—as I hope to be able to show—be also with advantage discontinued in future in the erection of new holders. I mean that of connecting two pipes, the usual inlet and outlet, thereto. Now, I have the honour of submitting to the notice of this meeting an entirely new arrangement of the connecting-pipes of gasholders—the simplicity and efficiency of which gentlemen can judge of for themselves, by reference to the drawing illustrating the scheme—whereby one pipe into each holder secures all the advantages hitherto obtained by two pipes.

Let us take as an example a gas-work where there is only one holder, and ask ourselves why it is supplied with two pipes—the conventional inlet and outlet, and it will be seen, that, so far as the working of the holder is concerned, one pipe would answer just as well as two. The flow of the gas, were there only one pipe, would be simply this, that if the make was greater than the consumption, the surplus would go into the holder; if the make and consumption were equal, the contents of the holder would remain constant; and when the consumption exceeded the make, the difference would be supplied from the holder. But when more holders than one are connected to the same outlet main, two pipes—in the ordinary way of making the connexions—are necessary to enable any one of the holders to be filled or emptied, or shut off as required. Hence the somewhat clumsy expedient that has hitherto prevailed of laying an extra pipe into each holder to overcome the difficulty. Now that difficulty, I respectfully beg to submit, is effectually solved by the plan of arranging the valves and pipes as shown on the drawing.

By that arrangement it will be observed that there is one of my valves termed the by-pass, which is constant, whether for one holder of for a dozen, and that the number of valves required, in addition to the by-pass, is at the rate of one for every two holders, the connexions being simply a straight line of piping running along the front, and another along the back of the valves, and that the valves can be conveniently arranged along the inside of the wall of the valve-house or governor-room without requiring any on the pipes in the yard.

In conclusion, I would beg to notice with commendation an improved method of working the gasholders, devised and patented by Mr. Ohren, of Sydenham, about two years ago, but which, it subsequently appeared, had been successfully applied for several years previously by Mr. Douglass, at Couper Angus, and by Mr. Dyer, at both Reading and Burton-on-Trent, viz., the fixing stops to all the holders but one, by which means they fill in succession, in the order of the lightest first and heaviest last, and empty themselves in the reverse order, without any attention to the valves, which are of course in that case all left open. But as there are times when it is required to separately shut off the holders for the purpose of painting, repairing, &c., it is necessary to provide the requisite valves to enable that to be done. My improved arrangement of the connexions, it will be evident, is equally applicable to the method of opening and shutting the valves as required, or to the plan just alluded to, of leaving the valves all open. And from the fact of the valve having no ground faces or rubbing surfaces, it cannot possibly stick, however long it may remain unmoved, and it is, therefore, peculiarly well adapted for the purpose under consideration.

Mr. PATERSON, of Warrington, said he concurred generally in the statements made in the paper just read, but on one point he was not entirely of the same mind with the writer. Mr. Cathels thought that in the case of small gasholders trussing might be dispensed with. He (Mr. Paterson) considered that only in the case of large holders it could be well done without. He had never constructed small holders without trussing less or more, and there was often an advantage in doing it. With respect to the improvements which had taken place in gasholders, he thought they were much indebted to that very eminent and distinguished engineer, Mr. King, of Liverpool, who was the first to alter the general form of construction. He agreed with Mr. Cathels that there was not much use in having dry wells. If proper care were taken in the construction of the gasholder tank the dry well was really not necessary. It involved a considerable addition to the expense, and from his experience in the erection of small gasholders, he believed it might very easily be dispensed with.

Mr. CATHELS said the small gasholder to which he had alluded was only 40 feet in diameter. He had over and over again tested it by running all the gas out till the top became convex, like a saucer. It rested on the surface of the water, and as the gas was allowed to flow in it rose again. He had done it at least half a dozen times, so as thoroughly to test the feasibility of it.

Mr. ATKINSON, of Hull, said gasholders made in the way described would be like Horton's flat-top gasholders. If not always kept full, the snow or rain would be liable to settle on them, so that they would soon get into bad condition. Another disadvantage would arise from the absence of trusses in the difficulty of putting in a new sheet or repairing an old one, or in pitching the holder on the top.

Mr. CATHELS said it was only in extreme cases that they could get a

holder in the state of which he had spoken. In practice the holder was never entirely emptied, and the elastic force of the contained gas would keep the crown distended.

Mr. BRADDOCK, of York, said the great difficulty in all gasholders was not so much in the working of them as when thown out of work. The first gasholder he ever knew of without a roof to sustain the top was one put up by Mr. Croll. His old friend, Mr. Green, of Bolton, had put up one of considerable size—120 or 130 feet in diameter—without a roof; but he left the scaffolding in, so that when the gasholder was out of use it rested on the scaffold. He believed that this was a cheap and economical mode of getting over the difficulty. Mr. Cathels would excuse him for differing from him as to not having two pipes in the gasholder. In small works he thought it important that there should be an inlet and an outlet. It would frequently happen that in summer time the whole of the retorts in small works would be charged at once. They all knew that the illuminating power of the gas varied almost entirely according to the duration of the charge, and if there were only one pipe going in and one pipe going out, and the charge were nearly exhausted, they must be pretty well aware that it would affect the lights very considerably. In very large works and works were the charges were taking place at least every two hours, the effect would scarcely be felt, but for small works it would be a serious matter.

Mr. CATHELS said the condition alluded to, could only possibly occur when the make and the consumption were precisely alike. Under other conditions, the gas by one pipe became mixed as much as by two.

Mr. METHVEN, of Bury St. Edmunds, said from his own experience he could state that he had found even with two pipes there was considerable difficulty in small works in supplying gas of uniform quality, and it struck him that the difficulty would be much enhanced with only one pipe. With reference to the trussing of small gasholders, presuming that by that description was meant those under 25 feet diameter suitable for village works, he thought the trussing cost so little that there was no practical benefit in getting rid of it. Moreover, it assisted the maker, and saved scaffolding. Besides this, it was often the case that in small works there was not the same amount of care exercised that there was in larger ones, where more experienced men were engaged. Sometimes it would happen that the tank became leaky, or the man would let all the gas out, and then the pressure of the atmosphere exerted a very prejudicial influence upon the crown of the gasholder.

Mr. MORTON, of Woolwich, regarded the trussing of gasholders as a very important subject. He would like to hear from Mr. Patterson why he considered that small gasholders required it if large ones did not. There seemed with some people to be an apprehension that in the lowering of gasholders without trusses some damage might be done to the roof, but the holder which Mr. Cathels had spoken of had no support at all, and was allowed to become convex on falling without being injured. Most persons were aware that if a gasholder was down on a hot day a collapse would take place in a trussed roof as well as in one that was untrussed, for nothing could withstand the pressure upon it. He concurred in the observation that there was no use in having two pipes in the gasholder; but Mr. Cathels did not quite answer the objection of the gentleman who spoke of thin gas in the case where the make was larger than the consumption at the time. At the end of a charge, where the consumption was less than the make, the gas would be supplied direct from the retorts.

Mr. ATKINSON said about a week previously he was discussing this subject with an eminent practical man, and it was mentioned that in the case of a gasholder, made by Mr. Malam, at Swaffham, on the principle of having a single inlet and outlet pipe, it was found that when the night pressure came on the gas was inferior to what it had been during the earlier part of the evening. That was a matter of practice; he did not exactly remember the reason assigned for it.

Mr. BLACKBURN, of Hebden Bridge, said he had found two pipes necessary when it was required to clean out, because he could not stop the outlet-pipe on account of the requirements of the district.

Mr. ESSON, of Cheltenham, said, in respect to the flat crowns, the simple matter to be considered was the form they would assume. The form which the elastic top of a gasholder would assume under the circumstances of its action was hemispherical. In making steam-boilers, or any other vessels to sustain pressure (and what was true in regard to excessive pressure was true also in regard to a moderate one), they generally gave that form to the vessel which would distribute the force equally over the whole, and it was found that a hemispherical body was that which would sustain the greatest pressure. It must be remembered that it was not only its own weight which the roof had to carry, with the levity of the gas under it, but it had also to carry the sides of the holder; and as the roof rose, unless the junction between the sides and the roof was of sufficient strength, the sides must drop off. So far as his experience went, he certainly preferred a trussed roof, as being the safest under the circumstances, and as most likely to meet the requirements of the case. With regard to the use of two pipes, the best way to determine that question was to ascertain what were the facts. One gentleman had stated that even with two pipes it was not always possible to get gas of an uniform quality. He agreed in that remark, for he had himself found it so on many occasions. That being the case, it set aside all theorizing on the subject. No doubt in large works, where the charges were made every half hour or every hour, Mr. Cathels's statement was quite correct In erecting some gasholders lately he had put in only one pipe, considering it quite sufficient, but that was in works where the charges were made every hour. He had also made the pipe of sufficient size to admit of a man getting in if necessary when the gasholder was down, the pipe being properly ventilated, and having a man-hole in the roof to let him out.

Mr. PIGGOT, of Birmingham, said that his father, when manager for Mr. Joshua Horton, manufactured the first gasholder on the principle referred to by Mr. Cathels. With respect to flat-top holders, he did not think they would last so long as holders with a frame. The strain upon the roof was very similar to the strain of steam upon a hemispherical boiler, and the weight of the sides of a large gasholder was a serious weight on the sides of the top; so that, unless the frame was made very strong at the junction of the sides with the top, it would act injuriously. He had only made one gasholder without framing. That was a holder 120 feet in diameter for the works at Liverpool. It was made with a strong curb, to prevent the shape being altered when the weight came on. It had answered very well, but then Mr. King never allowed the top to come down, fearing the consequence. The holder was made perfectly flat on the top, and when the gas came in the sheets rose in the centre 2 feet 6 inches, although made and riveted on a framing perfectly flat. This showed what pressure the gas must have upon the iron. The greater portion of the gasholders at present made were made with framing. In the construction of gasholders without framing the contractor had to go to a great expense in putting up a temporary one during construction and afterwards at the place where it was erected, which, in the case of gasholders with frames, was not necessary. He knew, as a fact, that in the 120 feet holder he had referred to for the Liverpool works the whole saving was only about £30.

Mr. MORTON asked if the top of the sheets were now fixed to the framing in the case of gasholders with top framing.

Mr. PIGGOT said they were formerly, but now the sheets were left perfectly free; they were merely fixed to the upper sides.

Mr. MORTON said he did not see the slightest use or service which the framing was to the roof sheets. The sheets not being attached to the framing must support the sides. The objection raised by Mr. Esson was that the strength of the roof sheets was taxed with the weight of the side sheets. He (Mr. Morton) had always understood they never were attached; therefore, that argument in favour of framing fell to the ground.

Mr. ESSON said they were all attached at the top, around the centre plate. Supposing the top plates were not attached to each of the rafters from the ground to the top sides, they were attached to the centre plate, and it was found more advantageous to do it in that way than otherwise.

Mr. MORTON thought that that did not make a great deal of difference, because there was a distance from the curve to the centre plate all loose from the framing, and to which the framing rendered no support at all. No doubt a gasholder, or anything else, with a frame in it was stronger than without, but the utility of it was another thing. The strength to resist lateral strain might, he thought, be attained in a cheaper form than by the use of framing.

Mr. CATHELS said when a holder was out of use it did not necessarily follow that the crown dropped in. It was not until it was weighted for the sheer purpose of testing it that it could be brought into a convex shape, and then it rested on the water in the tank.

Mr. PIGGOT, in reply to an inquiry, said that he had not used double-angle iron for three or four years for the cups of gasholders, and for the last six years he had never riveted a crown round the centre, but always made it perfectly loose.

The PRESIDENT, with reference to the suggestion that the columns might be made of wrought instead of cast iron, said it was already done in some cases. A large gasholder belonging to the Phœnix Gas Company in London was constructed in that way some years ago. It was a perfectly successful work, but at the same time it was not a very eyeable work. He did not think it was much cheaper than cast iron, and it was very much more corrodible. In his own practice, notwithstanding that wrought iron was lighter, he certainly should prefer (except where the cost of carriage was a material element in the expense) cast-iron to wrought-iron columns; but when the works had to go abroad, as to very remote parts of India, where they would have to be carried far up the country by conveyances very ill adapted for heavy weights, it would then be desirable to substitute wrought iron for cast. In this country, according to his experience, the reverse was the case. With regard to the size of gasholders, the subject had recently attracted a great deal of attention. He thought the accidents that had happened had really occurred from some invasion of the laws which govern the strength of the crowns of gasholders. It so happened that the roof of a gasholder in use assumed the form of a portion of a circle; it was either built in that form in the first instance, or the pressure of the gas caused it to be convex externally. In assuming that form it became a portion of a sphere, and if they took the diameter of that sphere as their guide, they would find that every part of the crown was strained with a force which was exactly proportioned to the diameter of the sphere of which it was a part. If, therefore, with a flat-crowned gasholder, it should assume a certain degree of rotundity, that degree of rotundity was a portion of a very large circle—it might be a circle of 2000 feet in diameter. Now, though the gasholder itself might be only a small one of 100 feet in diameter, the plates, to have the proper degree of strength, must be proportioned to the sphere of 2000 feet. It was very frequently the case that gasholders were not made strong according to that law, and the consequence was they had slit across the crown. He was in constant apprehension that gasholders made upon the principle they had been of late years would, after they had become a little more weak by corrosion, suddenly slit across the top, perhaps with some considerable catastrophe. Attempts had been made to deal with the difficulty, either by putting radial bands, or by making the plates of different thicknesses—thicker towards the outer edge, and declining in thickness towards the centre—which must necessarily be an error, because all the forces were radial, and the same strain per square inch or per square foot was upon every part of the crown. There was no difference in the strain; upon every portion of the crown there was precisely the same amount, and therefore there ought to be the same thickness of plates, except towards the outer edge, where thicker plates were required, not for that purpose, but for purposes in connexion with the fastening of the sides and the central column, if there should be one, to the crown. This brought them at once to this consideration, and it followed immediately from the law in operation in these cases that it was much better to leave the crown unattached to the frame, if there should be a frame, than attached to it, because if it were attached it prevented the crown from assuming that proper form which was consistent with the uniformity of strain. Then, again, with regard to trussing, for his part he thought that trussing was exceedingly useful, and for this reason, that if not trussed they would have the crown alternately rising and falling. The consequence was that, in the performance of its operations, the crown, because it had to be brought into a smaller compass, must either corrugate or the rivets must work upon each other, and thereby be very liable to set the gasholder leaky. On all accounts, therefore, he thought it better that gasholders should be trussed. But there were two modes of practically trussing them—one by trussing the interior, and allowing the trusses to rise and fall with the holder, the other by having props or permanent scaffolding underneath, which performed the office of a truss when the gasholder settled down. For his own part, he thought it was better that the gasholder should carry its own truss, and as Mr. Piggot had stated that there was little or no difference in the cost, he should recommend, in all cases, the trussing of gasholders. As to the necessity for two pipes, he thought it might be conceded, after what had been stated, that that necessity generally existed, not only because the quality of the gas varied at different times, and it was required to mix it as much as possible in the gasholder, in order that it might be delivered of tolerably uniform character, but there were two conditions under which it became exceedingly necessary to have these two pipes. One was where they worked with an exhauster with the liability to undulations of pressure, which there always was, more or less, even with the best exhausters. It did not answer, as they were well aware, to allow those undulations to be conveyed along the pipes into the town; but it commonly happened that they were so conveyed unless they were mitigated, and, in fact, made to disappear by distribution over the whole surface of the gasholder. The

two pipes were exceedingly useful for that purpose. With regard to the maintenance of uniformity of quality, when working in and out of the same gasholder it would be highly useful, instead of having two pipes and putting them together, to have them on the opposite sides of the gasholder, so as to ensure that the gas should not come down one pipe and up another, as he had known occasionally to be the case. Then with reference to the dry well, he believed that, *per se*, it was of little or no use. The only advantage, so far as he knew, was that it enabled them to get to the pipes below without removing the earth. Frequently when the earth was removed there was a disturbance of pressure against the sides of the tank, which was liable to set it leaking. Having regard, therefore, to constructive safety, it was desirable to have dry wells.

A vote of thanks was given to Mr. Cathels for his paper.

Mr. Thos. H. Methven, of Bury St. Edmund's, read a paper

ON OPEN-ENDED CLAY RETORTS.

There are few managers of provincial gas-works of a limited size who have not been troubled with the removal of the carbon that accumulates on the inside of clay retorts. In their case it is difficult to obtain and keep men who are experienced enough to remove it quickly without damaging the retort, and, therefore, the ordinary stokers have to undertake the work. Sometimes the emergencies of the manufacture of gas prevent the removal of the carbon until it is 2 or 3 inches thick in the middle, and more towards the end of the retort, so that it is necessary to keep the lids an inch or two open for a day or two, in order that the air may consume what the chisel has failed to remove. Frequently the retort is so shattered by the inexperience and haste of the stokers as to cause great trouble in mending it, and loss of gas during the period which elapses before it again becomes gas-tight.

This, at least, has been the writer's experience, and doubtless that of many similarly situated, who, perhaps, like him, have tried all the methods recommended, such as cold air, steam, wet breeze, &c., with but little success. Some years ago, having seen in the Journal of Gas Lighting, a recommendation from a Scottish gas manager to fit a tapered cast-iron piece to the end of the retort furthest from the furnace, which was partially to be enclosed in the retort-arch and heated by the retort-flues, whilst the external end was to be fitted with a lid luted in the usual manner, he was led to modify the plan.

The necessity for building a new retort-house and stack of 30 retorts, furnished a suitable opportunity for adopting the plan. In the wall of the retort-house five arches, corresponding to those in the retort stack, were built. The retorts were made long enough to pass from the front to the back of the retort stack, and had the end furthest from the furnace reduced to a 9-inch hole, which was furnished with a light cast-iron mouthpiece and lid, secured on the usual plan. To prevent radiation of heat, the arches in the retort-house wall were filled in with 4½-inch temporary brickwork.

When the retorts are to be "scurfed," the 4½ inch brickwork is torn down, the 9-inch lids taken off, the tarry matter and coke that has been allowed to accumulate is removed, the cap is taken off the top of ascension-pipe, and the ordinary retort-lid is closed.

The cold air now rushes through the retort, drawn by the ascension-pipe, which acts as a chimney. The carbon now can either be entirely consumed, and thus removed without any manual labour, or more quickly removed by means of chisel bars, after the air has passed through the retort for two or three hours, for it is found that the contraction of the carbon, caused by the current of cold air, makes it adhere less firmly to the retort.

The writer has often had a set of six retorts scurfed in six hours, ready for the next charge, although usually twelve hours is the time occupied by the operation. Since adopting the plan the make of gas is seldom reduced at scurfing time, and the stokers have not damaged the retorts during the four years in which the plan has been tried. The retorts are scurfed every eight weeks, during which the six retorts carbonize 120 tons of coal, and collect 2½ cwts. of carbon. He claims no merit in the invention of the plan, but having had much less anxiety since its adoption, and having been enabled to do much better work with a smaller number of retorts, he wishes to bring under the notice of others that which has been so beneficial to himself.

Mr. Simpson, of Rugby, said a friend of his, a member of the association, had communicated to him his mode of scurfing. He introduced a pipe of large dimensions 2 or 3 inches from the mouthpiece, carried it to the back of the retort, and took off the cap from the top of the ascension-pipe, which caused a current of air. That plan was somewhat similar to the plan of Mr. Methven, but it was not always practicable to get access to the back, but he saw no reason why the plan should not act when passing from a pipe from the front.

The President said he supposed the mouth was closed in some way.

Mr. Simpson said there was a hole cut in the lid of the retort which the pipe fitted.

Mr. Goddard, of Ipswich, said he had seen and tried the plan of the last speaker, when iron retorts were more in vogue than at present. He remembered on one occasion that the draught was so great as to burn a hole through the retort by the pipe which was introduced at the far end. He had seen the plan proposed by Mr. Methven, and it recommended itself to his judgment. The rapidity with which, according to that plan, the retorts were scurfed was very much in favour of its adoption. One objection might be raised to it—viz., that undue expansion was given to the external wall of the retort-house, but by having the 4½-inch brickwork built inside the arch that objection was entirely obviated. The scurfing was done very completely, and very little injury was sustained by the retorts.

The President said he presumed that with long-ended retorts the operation could be performed alternately from each end without trouble.

Mr. Methven said he had not tried them. His originally were 8 feet long, and he added 2 feet to the 8 feet, which were tapered, but the tapered piece was of little use for carbonizing purposes.

The President inquired whether, supposing there were double retorts existing, the operation could not be performed by closing one end and leaving the other open, and taking off the lid of the ascension-pipe at the closed end, so as to form a chimney alternately at each end.

Mr. Methven thought that there was no doubt it could be done.

Mr. Throsby, of Lincoln, said some time ago Mr. Methven, when at his works, suggested that they should take off the ascension-pipe cap alternately at each end. They had adopted that plan, and found it answer exceedingly well. They could now clear away the carbon from the pipes in one-third of the time it previously occupied, and therefore he had great pleasure in bearing his testimony to the efficiency of Mr. Methven's system.

Mr. Paterson referred to a plan adopted by Mr. Young, of Dalkeith, a few years ago, and described at that time in the Journal of Gas Lighting. He had no doubt of the efficiency of the present plan for removing the carbon, but he disapproved of everything of the kind. He had uniformly found that in burning off the carbon from the surface there was a tendency to remove the incipient carbon which filled up the interstices. He thought the better way was to prevent the deposition of carbon at all. Where exhausters were in use he thought it quite possible, whether the retorts were clay or iron, to work them all through their lives without the deposition of carbon. At his works they employed through retorts 20 feet long, and he had recently removed some that had been in use for 22 months (which was a longer time than usual for them to last), and yet he had not been troubled with carbon throughout the period of their working. To prevent its accumulation, he employed an instrument which was used in the retorts for the purpose of scurfing, and which he continued to use for two months every alternate charge after the retorts were set. He had generally found that when this was carefully attended to by the stokers the inner surface of the retorts became so clean that they were not liable to be choked up. In fact, there were no points upon which the carbon could form, and, therefore, no deposit took place. He was quite sure that any one working either long or short retorts would find this method quite efficacious for the purpose. After the carbon was once formed he did not think it was desirable to burn it entirely off, as it was injurious to the retort. In answer to questions by the president, he said he used clay retorts entirely. He did not work under a vacuum. He allowed a pressure of about 1 inch upon the retort inside—just the amount of the dip into the main. He used both cannel and common coal. He did not find that it scraped the retort away by getting out the carbon at every charge. The instrument he used was formed like the segment of the retort, whatever the shape might be, and had a thin steel blade. It was attached to a lever, which enabled the under side of the blade to run along the bottom of the retort, and a turn was given either to raise or depress it, as circumstances might require.

Mr. Esson said he was extremely delighted to think the last speaker agreed with him that they ought not to have any carbon in the retorts. In some respects he believed that he held peculiar views on this subject. At his works they had no seal, no hydraulic main, and little or no formation of carbon. For instance, if he were to light 10 or 20 retorts just now they would go till next Christmas without requiring scurfing or anything else. The plan of using a steel rake was a common and useful one where there was a pressure, and a gradual collection of carbon. It removed it very readily, as he had found for a long time from experience. The instrument was not a large one, and was easily managed; and if used from time to time—say, after every second charge—it was very successful indeed. The way to do away with carbon altogether was to work the retorts at zero, and not to draw in any air. There was such a demand for rich and beautiful gas at the present time, that they would spoil it if they did. Having no interposing seal between the retorts and the exhauster, it was quite possible to work at zero, and in that way they could prevent the accumulation of carbon, and keep up the illuminating power; the retorts, too, would last much longer. Most of those present were familiar with the valve which Spinney had for his ovens. Instead of that valve, which was attended with some drawbacks, inasmuch as the tar gradually became converted into pitch, he had introduced a simple throttle-valve, which was used upon the pipe of the steam-engine, with a lever and rod, by which the stoker could open and shut it when necessary; and he found that this answered the purpose very well.

Mr. H. Woodall, of Longton, asked whether he was to understand Mr. Patterson that there actually was no deposit in his retorts, or whether it was that the carbon was removed as fast as it became deposited, through the continual application of the instrument.

Mr. Paterson said there would be at all times, but especially when the retorts were new, a deposit of carbon, and it was to prevent the accumulation of it that scurfing was desirable. If that were continued for a time, the inner surface of the retort became smooth, and there was nothing for the carbon to collect upon. After the first setting of the retorts it required to be frequently repeated, and during the whole time of their existence it should be occasionally done.

Mr. Fraser, of Loughborough, had had experience in the working both of iron and fire-brick ovens, and therefore might be allowed to say that, though Mr. Paterson might find his plan of scurfing very applicable to clay retorts, it would be rather a difficult matter for him to keep down the carbon in the case of large ovens. He quite coincided with the remark that their aim should rather be to prevent the accumulation and deposit of the carbon than to provide means for removing it after deposition. He had been able to keep down the carbon in iron retorts, so as not to occasion trouble, by the continual use of a bar of iron, light and sharpened at the end, and made to fit somewhat closely to the bend of the arch of the retort. It was made a part of the duty of the workman to keep the carbon down, and by the use of this instrument he had little difficulty in doing it. But with Cliff's patent ovens, at his works, he had considerable difficulty in keeping the carbon down; it had been known to accumulate to the extent of 2 inches, and in one instance he measured a piece which was 9 inches. It would be very desirable to open up a current of air, as suggested, through the retort, when they were so constructed as to admit of it; but he agreed with Mr. Patterson, that it would not be desirable to remove the whole of the carbon in an oven constructed entirely of bricks.

Mr. Newall, of Littleborough, said at Manchester, Oldham, and some other places, they were erecting nothing but brick retorts, and they had a pipe, or fan, or a pair of bellows, by which the air was pumped or blown in, which was found to answer the purpose, and to burn off all the carbon.

Mr. Braddock said he had had a good many battles with carbon, for he was a very old clay-retort man. He first began with a common fan in the chimney with which he made a blower, and blew out the carbon in pieces almost as big as himself. Since then he had adopted the through retorts, and of course had very little difficulty in cleaning them. Where the ends could be opened in the way suggested by Mr. Methven, his plan might be a very good one.

Mr. Methven, in reply, said he quite agreed in the remark about the undesirableness of wholly removing the carbon. To burn it off entirely was likely to make the retort leaky; but by simply exposing the carbon to a current of air, the contraction which followed that operation enabled it to be removed quickly with the bars simply from the surface, and not from between the cracks. It was objected that the plan he recommended was difficult of application in works already erected. Of course it could not be adopted in those cases where the retorts were placed back to back; but in other cases it might be. With respect to the non-formation of carbon, no doubt it was desirable, but the fact was in many works there was no opportunity of preventing it. Exhausters were not in use in all works, and the carbon would form in spite of all their efforts. The employment of the instrument referred to would help to keep it down. That was clearly the case at the mouth of the retorts where the drawing iron came in contact with the retort, but the great difficulty was to get stokers to attend to any plan of the sort regularly. As to the application of bellows,

or fans, it must be remembered that it was not every one who had power on his works to drive them. The plan he had brought forward was very simple, indeed that was its great advantage, providing the retort-house was suitable for its adoption; but it required that the exterior wall of the retort-house should be arranged for the purpose.

The thanks of the meeting were voted to Mr. Methven for his communication.

Mr. Fraser, of Loughborough, read the following paper:—

ON THE DISTILLATION OF COAL AT VARIOUS TEMPERATURES.

In Clegg's recent "Treatise on the Manufacture and Distribution of Coal Gas," we are informed: "That the chief objects that should be regarded in the generating department of its manufacture for illuminating purposes are:—1. The formation of a due proportion of illuminating and non-illuminating constituents, so that on the one hand the combustion of the gas shall be perfect, and without the production of smoke or unpleasant odour, and on the other, the volume of gas required to produce a certain amount of light shall not be too great. 2. The extraction of the largest possible amount of gaseous illuminating compounds from a given weight of materials. 3. The presence of the largest possible proportion of hydrogen amongst the non-illuminating constituents, to the exclusion of light carburetted hydrogen and carbonic oxide, so as to produce the least amount of atmospheric deterioration in the apartments in which the gas is consumed." Therefore it is highly desirable that the gas manufacturer should primarily acquire some accurate knowledge of the character and properties of coal, to enable him to select that description which is best adapted for his purpose.

Dr. Muspratt, on this subject, says: "In the first place, it will be manifest that the greater the quantity of hydrogen and the less oxygen and sulphur a cannel or coal may contain, the better it will be for gas-making, for the latter two rob the coal of a portion of its hydrogen, which is thereby prevented from uniting with a portion of carbon for the production of an illuminating gas. The coal should be selected as free from iron pyrites and sulphate of lime as possible, and lumps or masses of these should be thrown out, as they often occur in such a form in the coal."

Having good reason to believe that the first requisite—coal good in quality—has been secured, the conditions of manufacture next demand our close attention. In considering these, it will always prove of great importance that the apparatus by which the operations are to be conducted, should possess all the most recent improvements of construction. It will invariably be found that the greater the surface of coal that may at any one time be exposed to the direct action of heat, the more readily and the more effectively will the gas be expelled from it.

I shall now proceed to consider the temperature at which the distillation of coal can most advantageously be effected, so as to yield the best general results to the gas manufacturer. Upon this part of the subject I have thought it desirable to refer to the facts that have from time to time been elicited as the result of carefully conducted chemical analysis of the products of distillation of coal at different temperatures. The late celebrated chemist, Dr. Ure, says "that the distillation should commence with a retort previously heated to a cherry red, since thereby good gas is immediately produced, and a portion of the tar is also converted into gas instead of being simply distilled over into the condenser pit; that this heat should be continued during the whole of the distillation from five to eight hours—that is, should not be increased, especially towards the end, for fear of generating carbonic oxide and hydrogen gases, as well as of injuring the retort when cooling, as gasification has become feeble; and that the operation should be stopped some time before gas ceases to come over, lest gases with feeble illuminating power should impoverish the contents of the gas-holder." Professor Miller, of King's College, London, writes: "One of the points of greatest importance is the due regulation of the temperature during the distillation. The retorts should be heated to a bright cherry red; if they be insufficiently heated, the products contain a large quantity of the vapours of condensable hydrocarbons, which collect in the gasometers and the distributing-pipes, and occasion much loss and inconvenience; whilst if the temperature be too high, or if the gas after its production be allowed to remain long in contact with the highly-heated surface of the retort, it undergoes partial decomposition, a portion of its carbon is deposited, and forms a dense layer upon the interior of the retort, which it gradually chokes up, and at the same time the illuminating power of the gas is proportionally diminished by the loss of this carbon. In addition to this inconvenience, bisulphide of carbon is apt to be formed in small quantities if the distillation be conducted at too high a temperature, and no means are yet known by which this body can be removed. When gas which contains this impurity is burned, it gives rise to the production of a minute quantity of sulphuric acid, which gradually accumulates on the furniture of the building, on the binding of the books, &c., and slowly corrodes and otherwise injures them." Dr. Letheby, in his able lecture delivered at the last meeting of this association, says: "Up to the temperature of 700° Fahr. little or no change was effected in the coal, beyond the evolution of physical moisture; at the temperature of melting zinc, 773°, a little chemical moisture, with an empyreumatic odour was produced; at 980°, which is a red heat just visible in the dark, water and fat oils, the paraffin series, begin to distil, but there is little or no gas; at 1500°, which is a cherry red, gas of high illuminating power is copiously evolved, and spirituous oils rich in carbon also appear. At a full red heat, 1800°, and from this to incipient whiteness, permanent gases of poor illuminating power, as carbonic oxide, marsh gas, and hydrogen, and pernicious sulphur compounds are freely evolved; practically, therefore, it may be said that the best temperature for distilling common gas coal is a cherry red, 1500°, and for cannel coal a full red, 1800°." Robt. Aytoun, Esq., Edinburgh, in a paper "On the History of Coal Oil," read before the Association of Gas Managers in Scotland, on the 27th of July, 1864, mentions the growing increase of temperature in the distillation of coal for gas in the following terms:—"The fact published by Dr. Ure in 1805, that a bright cherry red heat was the best for gas, could not fail to have a beneficial effect on gas-making, by causing the distillation to be conducted at a higher temperature than that which was heretofore employed by the coal oil distillers. But the full advantage of it was not reaped for a number of years, in consequence of the iron retorts not being able to stand a bright cherry red heat." After referring to the introduction of fire-bricks for defending of the retorts from the direct action of the flame, he goes on to say: "This was a very great improvement to the gas manufacturer, which, while it diminished the expense of retorts, admitted of the distillation being made at a cherry red heat, whereby both the quantity and the quality of the gas were greatly improved. The increase of temperature, in the opinion of the best judges, had now reached the proper degree." He further states: "The iron retorts when clothed with fire-bricks maintain very well a bright cherry red heat, and the gas evolved was everything that could be desired. But the increase of temperature did not stop at this useful point. The managers of gas companies, compelled by the insane cry for cheap gas, urged the heat of distillation far beyond the bounds required for good gas. This they were enabled to do by the manufacture of earthenware retorts—a manufacture which rose up as if by magic to meet their wants. The gas is greatly increased in quantity by this means, but sadly diminished in illuminating power." Dr. Muspratt, describing the changes which take place during the manufacture of gas by the distillation of coal in red-hot retorts, writes: "The quality and illuminating power of the gas will be affected, not only by the quality, composition, and condition, wet or dry, old or recently obtained, of the coal or cannel, but by the degree of heat employed in its preparation, and the mode in which the operation is conducted. When coal or similar organic matters are distilled at a comparatively low temperature, the carbon has a disposition to pass off with little hydrogen; the liquid carbides of hydrogen are formed; there is much tar and little gas, but the latter is rich; as the temperature rises, the liquid carbide of hydrogen diminishes in quantity, and gaseous carbide of hydrogen increases; there is more gas and less tar. The heat still rising, the gaseous products become rich in hydrogen and poorer in carbon; light carbide of hydrogen is formed in abundance, and at length the temperature becoming still more elevated, pure hydrogen is evolved, as is always observed in the last hour's distillation in gas-making.

I shall at this stage notice the properties of olefiant gas. Professor Miller says of it: "Olefiant gas does not support life or combustion, but is itself very inflammable, and burns with a white luminous flame, depositing carbon abundantly upon cold bodies which are introduced into its flame. If it be transmitted through porcelain tubes heated to bright redness, it is decomposed; half its carbon is deposited, and another compound of carbon with hydrogen, L C H, is formed, which occupies the same volume as that of the olefiant gas from which it was produced. If the heat to which the gas is subjected be extremely intense, all the carbon is deposited, and for each volume of gas decomposed, two volumes of hydrogen are liberated." Dr. Muspratt writes: "When olefiant gas is passed through red-hot tubes, it deposits a portion of carbon in a solid form, and escapes as a mixture of carbide of hydrogen and hydrogen;" and goes on to say, "it has been perfectly ascertained by Leigh and other chemists, that if olefiant gas is passed through a nearly white-hot porcelain tube, it is entirely decomposed, depositing the whole of its carbon, and giving off pure hydrogen." He further adds: "The greater the heat employed, then, in the process of gas-making above a certain limit, namely, that requisite for the decomposition of the liquid hydrocarbons, the greater will be the bulk of the gas, and the poorer its quality; the more light carbide of hydrogen, hydrogen, and carbonic oxide it will contain, and the less volatile hydrocarbons and olefiant gas. The analysis of the gas will, therefore, furnish a test of the excellence of the process employed in the manufacture, by exhibiting in the relative amount of hydrogen, and of the illuminating hydrocarbons, whether the heat has been too great." The same author remarks: "A large quantity of gas may be made from coal, and very badly made. The mere amount of gas made is no proof of the excellence of the manufacture." I will now submit a remarkably beautiful illustration of that fact; it is one taken from a series of experiments, instituted by Mr. Barlow to determine the relative values, for gas-making, of the best Newcastle coal, and of Boghead and other cannels, the results of which are published at length in the third volume of the Journal of Gas Lighting. The experiment selected was made upon Boghead cannel, with the following results, viz.:—

	Cubic feet of gas per ton.		Equal to lbs. sperm. lbs.		Tar produced. lbs.		Coke produced. lbs.
At a very high heat...	14·900	..	1·932	..	710	..	720
At a low heat	11·632	..	2·126	..	720	..	715
Decrease	3·268		..		..		5
Increase	..		194		10		..

Each cubic foot of the former gas, when burnt in a No. 1 London fish-tail burner, was equal to ·957 grains of sperm, whilst that distilled at a low heat was equal to 1·275 grains of sperm. In this experiment it will be perceived less illuminating power was extracted from cannel when distilled at a very high heat than at a low temperature, though the yield of gas was much greater."

In order to obtain a better understanding of the entire subject, it may be well briefly to consider the nature and properties of luminous flame. Sir H. Davy says: "Whenever a flame is remarkably brilliant and dense, it may always be concluded that some solid matter is produced in it. On the contrary, when a flame is extremely feeble and transparent, it may be inferred that no solid matter is formed. The density of a common flame—that of a gaslight or candle—is proportional to the quantity of solid carbon first deposited and afterwards burnt." Professor Miller writes: "In all luminous flames the light is emitted from solid particles highly ignited. The flames used for illuminating purposes are all produced by the combustion of compounds of carbon and hydrogen. All of them, notwithstanding the perfect transparency of the gas before combustion, contain solid particles of carbon during the act of combustion." Dr. Frankland says: "Every mode of artificial illumination depends upon the incandescence of certain bodies in gas and oil flames; it is the incandescence of little particles of carbon, and in all these cases the light is produced from solid matter." B. H. Paul, Esq., in a paper read before the Society of Arts, says: "In the production of artificial light, by any of the means that have hitherto been commonly used, it is always the result of the intense ignition of solid particles of carbon." Mr. Hawksley happily represents that carbon is as essential a property of good illuminating gas as alcohol is in good wine, and describes it as "the alcohol of the gas—the vehicle of light—not the light itself, but by ignition in a proper manner it becomes the vehicle of light." Clegg ascribes all the light of coal gas to olefiant gas, and the hydrocarbons contained in it; and it has already been shown that these undergo partial decomposition at a red heat. Clegg further says: "They are all instantaneously decomposed at a white heat. They all deposit their carbon at this temperature, in the form of exceedingly fine particles, which constitute so many centres for the radiation of light in the flame of a gaslight. The greater the number of such particles that are at any moment present in a flame the greater is the amount of light emitted by that flame."

I shall now endeavour to show that temperature exerts a considerable influence, which tends materially to the formation of sulphurous compounds and other impurities of coal gas. On the sulphur question I would refer to the reports of T. G. Barlow, Esq., C.E., of London, and M. Albert Ellissen, of the Paris Gas Company, dated 4th of July, 1864. Several experiments were conducted by these gentlemen (to determine the amount of sulphur) upon the gas of several London companies, and by Mr. Barlow on the gas made at the different stations of the Nottingham Gas Company. The quantity of sulphur in the London gas was found to be in excess of 20 grains per 100 cubic feet, whereas the average quantity in the Nottingham gas was

about 10 grains per 100 cubic feet. A number of experiments were also made, by the same gentlemen, upon various descriptions of coal. I will only submit the results of one. It is taken from the appendix to M. Ellissen's report, as follows:—

Mean Results of Several Experiments on Denain (French) Coal.

	Temperature (Fahr.)	Cubic feet of gas per ton.	Grains of sulphur.
At a high temperature (white) ..	2462°	10·400	5·939
At a low temperature (white) ..	1580°	8·300	3·431

It will be observed that the proportion of sulphur in 100 cubic feet of gas was reduced from 5·939 grains to 3·431 grains. I think the remarks of M. Ellissen towards the end of his report are sufficiently explicit on this question, when he says: "To sum up all, my experiments have shown that the temperature has a sensible influence on the production of sulphurous matters." He further adds: "The mixture of coal with cannel coal, which has been recommended as giving less sulphur, appears to me an error; for by increasing uselessly by this means the cost of gas, it would still be impossible to reduce the proportion of sulphur to 20 grains." That of course refers to the London gas.

I think that it will neither be entirely devoid of interest, nor yet too far apart from the subject, to briefly glance at some of the merits respectively possessed by clay and iron as media of distillation. Mr. Barlow, in the report already mentioned, remarks: "In the course of my investigations, I was much struck by the fact that the proportion of sulphur present in gas distilled in iron retorts was generally less than in gas distilled in clay retorts, where the pressure was taken off by means of exhausters; and I was at one time inclined to think that the products of combustion of the fuel in the furnaces might possibly traverse the porous material of which such retorts are composed by the operation termed 'endosmose,' and become mixed with the gas in the retorts. To set this theory at rest, I asked and received Mr. Hawksley's permission to make experiments at the Nottingham Gas-Works, where at one of the stations nothing but clay retorts are used, and iron retorts at two other stations. Contrary to my expectations, it was found that the gas produced in the iron retorts contained 14·86 grains of sulphur in 100 cubic feet, while the same coal distilled in clay retorts, and yielding substantially the same quantity of gas, contained only 7·41 grains; the only difference in the purifying process employed being, that, at the station where the clay retorts are exclusively used, the gas is washed with large quantities of ammoniacal liquor, pumped over and over again till it attains a high degree of strength, in which state it becomes exceedingly offensive. Mr. Hawksley has kindly promised to continue the experiments, with the view of ascertaining whether the diminution of the sulphur remaining in the gas produced in the clay retorts is in any degree owing to this washing, and should this prove to be the case, I shall make it the subject of an addition to this report." I have not had the pleasure of perusing the addition to Mr. Barlow's report, but the question has been satisfactorily settled by Mr. Hawksley himself, who has kindly supplied us with very important information by letter, dated 11th of July, 1864, and which was published on the 26th of the same month in the JOURNAL OF GAS LIGHTING, in which he writes: "At one of the stations of the Nottingham Gas Company, the gas is washed by a stream of ammoniacal liquor, the volume of which amounts to about 1/16th of the volume of gas." After describing the process, he says: "The result is that one-half of the bisulphide is removed, together with much ammoniacal and condensable tary vapours." It has been shown by Mr. Barlow that the yield of gas from clay and iron retorts at the Nottingham works was substantially the same, and the foregoing explanation by Mr. Hawksley now reduces the per centage of sulphur to a par. The illuminating power of the respective gases is not given; I will, however, endeavour to prove that the gas made in iron retorts should exhibit a greater illuminating power, for the following reasons:—"When we consider that deposits of carbon are more rapidly formed at a high temperature than they are at a low temperature, and that clay retorts are invariably maintained at much greater heats than it would be prudent to apply to iron retorts, the carbonaceous deposits in clay retorts for that reason must be on a more extended scale. Of this fact ample proofs are afforded us in our every-day experience of the annoyance and expense caused by the solid incrustation of carbon, that will speedily take place in clay retorts if scurfing or some other means of reducing it be not regularly resorted to." I will next lay before you some of the variety of opinions that have from time to time obtained solely on the question of temperature. Sir I. Newton calculated the temperature at which iron begins to shine in the dark to be 635°. It was shown by Davy, that fusible metal becomes luminous at 812°. Daniel measured with his pyrometer the lowest point at which iron heated appears red hot in daylight, and found it to be 980°. Dr. Letheby says 980° "is a red heat just visible in the dark." It has already been proven that carbon largely governs the illuminating power of gas; it has also been shown that coal distilled at a medium temperature, as usual with iron retorts, yields gas rich in carbon and other luminous constituents of coal gas; therefore, all the other condition of manufacture being the same, it is clear that this gas will be more pure and of higher illuminating power than a gas evolved from coal distilled at a high temperature in clay retorts. Dr. Ure puts it down at about 600° or 700°. Noad places the commencement of ignition at 800°, a full red heat at 1200°, and an orange heat 1650°; considering, therefore, that there should be such uncertainty attending the exact temperature at which incandescence commences, it is not at all surprising that considerable variety of opinion should still exist with reference to that degree of temperature best suited for the profitable distillation of coal for gas, especially if we consider that we have to depend upon the evidence of sight alone in this matter, and that this is a very imperfect measure of illumination, because similarly illuminated objects convey to different individuals very different ideas of brightness. And on that account it must be apparent that a properly constructed pyrometer would prove a great boon at the present time; it would at once furnish a reliable indication of temperature in the flues and furnaces, by its agency greater regularity and a more uniform degree of heat would be secured, consequently there would be less wear and tear of the apparatus in the generating department of a gas-work. In the absence of such an instrument applicable for every-day use, considerable difficulty will be experienced in determining with accuracy the degree of heat applicable for the proper distillation of every description of gas coal. A good mean, however, may be laid down at 1650° Fahr., which will be found very closely to approach what is popularly designated a bright cherry red heat.

It is somewhat anomalous that the destructive distillation of coal for gas at a high temperature generally obtains, notwithstanding that it has frequently been proved to possess so many disadvantages. The gas produced is sadly deficient in illuminating power, whilst it abounds in sulphurous and other pernicious compounds. In many cases the deficiency has to be made up with cannel gas, at an additional expense, and a costly apparatus is rendered necessary for the removal of the impurities in the gas. And after all this has been done, it will even then unfavourably compare with gas produced at a moderate temperature from ordinary coal.

In bringing this paper to a close, I may remark that much has been omitted that might reasonably have been introduced. For instance, the effect of moisture in coal on the quality of the gas, the effect of temperature on the residual products of the gas manufactory, and the relative value of clay and iron as midia of distillation; but these may well form subject matter for another paper. Experiments are now in progress with the view of eliciting some fresh facts relative to these subjects, and in which the writer feels personally interested. For this reason the results are at present withheld, but they will be made public in due time through some other medium. This paper does not profess to much originality; I have gathered facts from various sources, and brought little of my own beyond the string that binds them together. Neither does it profess to completeness; what has been advanced by me is little more than hints, which may in their present garb be compared to rough unpolished slabs. For artistic finish I have had no time, even if it had been my purpose; all that I have attempted is just to gather a little precious ore from a mine which is rich in materials of this kind. I trust, however, that in a condensed form some information on points of vital importance to all gas managers has been presented for consideration. I have endeavoured to lay before you the results of master minds, well qualified to judge of the subject matter treated, and it remains with you to bring their facts into practical operation.

I will conclude in the words of a recent writer on the same subject:—"The man of science rejoices in the discovery of truth for its own sake. He gives his results freely to the world. It is not part of his duty, it is not his function, to apply those truths to the utilities of life. Success in this direction requires quite different powers of mind. Those who possess these powers ought also to acquire the knowledge which would enable them to seize upon the discoveries of science, and apply them to the wants of every-day life. This is the link which up to the present time has so sadly failed in the application of science to the manufacturing arts."

Mr. WOOD, of Hastings, said, with respect to the quantities of sulphur named, he presumed the writer meant, not free sulphur, but that sulphur in combination which could not be removed by the ordinary means of purification.

Mr. FRASER replied that he did not mean free sulphur, but the sulphur which was found to exist in gas after ordinary purification.

Mr. WOOD said that he was sure great advantage was gained by picking over the coal, and taking out the pyrites before carbonization. In that way they would get rid, to a large extent, of the bisulphide of carbon. By carefully picking over the coal at his works, he had got as low as 9 or 10 grains of bisulphide, whereas in other cases it had been upwards of 20 grains per 100 feet. The advantage was, therefore, considerable to the consumers as well as to the manufacturer.

Mr. CATHELS said the writer appeared to assume that because clay retorts were used, they must necessarily be worked at a much higher heat than iron. He did not think that that at all followed as a matter of course. It seemed to him that if the desired end depended upon the temperature, it could be equally well obtained with clay as with iron retorts. And after all, if iron retorts were set, they had invariably to guard them with a stratum of fire-clay material.

Mr. FRASER said Mr. Cathels must be well aware that clay retorts could not practically be worked at low heats, even when an exhauster was used. In getting up a bed of retorts, a large amount of leakage took place until a slight incrustation of carbon was formed on the surface of the joints, so that in practice it was not easy to work clay retorts, except at a higher temperature than it would be well to apply to iron.

Mr. GODDARD said reference had been made in the paper to the experiments made by the president at Nottingham, by washing with ammoniacal liquor, so as to remove the sulphur from gas. He should be glad if the president would inform the meeting the kind of scrubbers he adopted for the purpose. This was a subject which occupied a great deal of attention at the present time, and the question was, whether the description of scrubbers now in use were the best suited for the purpose. He understood that in the gas-works of Birmingham a scrubber was used which was called a "douche scrubber," which entirely removed the pressure in working, and was very effective. He did not know whether that was the same description as the one used at Nottingham.

The PRESIDENT thought the form of the scrubber was very immaterial. All that was needed was to provide that the water was kept in contact with the gas for a sufficient length of time. Whether the scrubber was round or square, or of a great or moderate height, was of no consequence, so that the gas was made to travel so slowly through it as to remain sufficiently long in contact with the liquor. At Nottingham, the effect was produced by pumping the water on to the hot gas almost immediately after it came from the retorts, and in very large quantities. A small quantity would not answer the purpose at all. The gas was suddenly cooled down by the ammoniacal liquor coming in contact with it. The ammoniacal products combined with the sulphur, and a new compound was formed. According to the quantity in which that was formed, so much less sulphur was there left in the gas. That was the whole mystery of the operation—if there was any mystery in it at all. As he said before, a very large quantity of ammoniacal liquor was required to do it—a small quantity was altogether inefficient.

Mr. PATERSON inquired whether, in using the ammoniacal liquor, the president pumped it into the washers, or had a separate system for working it in succession through and through until he brought it up to a sufficient strength, or whether it went direct from the tar-well into the washer.

The PRESIDENT said it was not an application of water as water at all, but simply an application of the chemical agent—viz., that agent which was contained in the ammoniacal liquor. It was not used in the ordinary sense for the purpose of being gradually strengthened up into a strong liquor, although it had that effect; the object was to purify the gas. It was only used once, in one vessel, and that vessel was the very first into which the gas entered after it left the retort, and before it passed to the condenser. It was then pumped round and round again from the liquor-tank in very large volumes—a volume which amounted to quite a sixteenth part of the volume of the gas itself. It was made to descend and meet the current of gas ascending at the height of about 20 feet, and there were four or five trays of smallish coke distributed over the vessel, so as to disperse the water and create as large a surface as possible for the gas to come in contact with.

Mr. PATERSON said, in the excellent paper just read, Mr. Fraser had justly remarked that the higher the temperatures the more liable was it to deposit carbon, and he made that an argument for the use of iron retorts. It might be desirable, and certainly it would be curious, to inquire what gave rise to this carbon—where did it come from? If the large amount of carbon deposited in the retorts was to be represented by volumes of gas, it must be something enormous, because those deposits were extremely large. For him-

self, he confessed that he had not the information which would enable him to judge where it was first formed, but perhaps the president would suggest an answer to the question.

The PRESIDENT said he believed the question would be answered by a much higher authority before the members separated, for, as he understood, it was one of the subjects of Dr. Letheby's intended lecture.

Mr. FRASER said he should probably have had something to say on the subject of carbon, but he felt it was in far abler hands. No doubt other gentlemen in the room could give a better explanation than he could. It was well known to be one of the properties of good gas, and the carbon was formed in the gas like any one of the other constituents, while the coal was being distilled. It was decomposed at a white heat, and if it went on rapidly depositing small particles it was very easy to understand that in a short time those particles would accumulate into a great mass.

A vote of thanks was presented to Mr. Fraser for his paper.

Mr. NEWBIGGING, of Bacup, read the following paper:—

ON THE BOOKS OF A GAS COMPANY, USUALLY DESIGNATED THE "GAS REGISTERS."

The office department of a gas company is one of the highest importance, for no little of the success of a concern depends upon the manner in which the books are arranged and kept. This remark is true under all circumstances, but it is especially true of companies whose business, being extensive, embraces a large number of consumers. Confused and unsatisfactory accounts are a fruitful source of bad debts and other irregularities, and are also the cause of many unpleasant misunderstandings between the company and its customers.

My purpose, in the brief paper which I have the honour and pleasure to submit to the members of the association, is to contribute in some small degree to the maintenance of order and regularity in the general manipulation of the gas accounts. My remarks will be confined to the arrangement and keeping of those books in the office department of a gas company usually designated the "Gas Registers." I am desirous to have it understood that I do not claim the merit of originality for all my suggestions. Many of the members present may be already acquainted with any modes of arrangement which I may be able to suggest or describe; but even to those may occur a point they had not previously thought of. To others the paper may prove of more extended advantage; and, altogether, it is hoped that, with the discussion it may evoke, it may be the means of suggesting some improvements worth appropriating and applying by each of us.

The gas register, as is well known, contains a list of the customers of the company, with the name of the street or district in which they severally reside; the state of the meter at the end of the past and present quarter; the quantity of gas consumed during the quarter; the cost of such gas per 1000 cubic feet; the amount due for the quarter's consumption; the arrears owing at the beginning of the quarter; the meter-rents, and a column showing the total sum due from each customer. Then follow the date of payment and the amount; a statement of the discounts, if any; a list of bad debts; the arrears owing at the end of the quarter, and a wider column for remarks. There is nothing very complicated in these books; a clerk of moderate ability being able to keep them without much difficulty. There is, however, a vast deal of writing and figuring in them; and in their preparation, posting, and balancing, a considerable amount of time and labour are consumed. To economize this time and labour as much as possible, consistent with correctness and perspicuity, is the aim of every intelligent manager or secretary having the office department under his control. I will briefly describe the plan of arranging the gas registers, which I consider to be the best and simplest, and I have here an enlarged form, which will render my description easy to be understood.

1. If the consumers exceed 2000 in number, I recommend that the names be arranged in two separate books, one moiety in each. By this arrangement, two clerks, if such are employed by the company, or the collector and a clerk, can be engaged in their preparation at one and the same time; a point of no little importance where it is desired that the bills should be got out promptly. No greater mistake can be committed by a gas company than to fall into the habit of delaying the delivery of the accounts until half, or nearly one-half, of the next quarter has elapsed.

2. I recommend that the registers be made so as to last six months, or two quarters, for once writing out the names. The advantage of this will, of course, be the saving of time and labour effected in their preparation.

3. The plan of writing the names in the middle of the book, or between the two quarters, is one which I strongly approve of. The advantages are obvious; the inconvenience of tracing the line from one side of the book to the other is avoided, and, consequently, there is less liability of making a mistake.

4. The pages may be conveniently arranged to hold 50 names each, so that the consecutive numbers (from 1 to 0) may be printed on each line, the same numbers being repeated five times on every page. Much time is saved in having the figures thus printed, because in completing the numbers it is only necessary to add the higher digits to every tenth figure, as shown in the form.

5. When the consumers are numerous, it will be found of the utmost utility to have the receipts of the different months posted in separate columns, as indicated in the form. By this judicious provision much of the inconvenience and loss of time consequent on the committal of an error in posting is avoided, for it is obviously easier to go through the postings of one month to detect the error, than to be compelled to wade through the interminable array of figures which constitute the cash postings of an entire quarter's rental. At the same time, although this is unquestionably a wide step in advance of the single column arrangement, a little experience of the plan taught me that unless the most scrupulous care were exercised in posting, mistakes would be committed by some items of cash finding their way into the wrong column. Indeed, if the mind be not constantly and intently fixed upon the work in hand, it is impossible to guard against an occasional error. This certainly was avoided by resorting to the plan of ticking every unoccupied line in the completed months, but the time required to do so was so considerable as greatly to limit the advantages of the system. I ultimately devised a remedy. It occurred to me that the tickings might be dispensed with, provided a different coloured ink were used in posting the second, or middle month's payments. This plan I immediately put in practice, by selecting blue coloured ink for the middle month, and it has answered the purpose intended to the fullest extent. An error in posting if now committed by the clerk is discovered at once, by just glancing over the columns for the vagrant figures in blue; but, indeed, it is almost impossible to make the mistake, because the contrast between the colour of the two inks is so conspicuous that an inadvertance in posting is detected before completion. Moreover, the work ceases to put such a strain on the mind of the person engaged in posting the books, and becomes more a mechanical act. If thought requisite, the third month might be posted in red for greater precaution, but it will be found generally that the middle posting in blue is sufficient, if not entirely to prevent mistakes, at least should a mistake in posting happen to be made to lead to its being easily discovered.

6. In the date of payment column, I dispense with the names of the months; these being already sufficiently indicated by the postings being made into the respective columns. The date of the month only is required.

7. It is not necessary there should be an arrears column at the end of the first quarter contained in the register; that column at the beginning of the second quarter answers the double purpose, as a reference to the form will show.

And finally, with respect to "removals," I recommend that an account of these be kept in a book for that special purpose, apart from the register, so as not to encumber and confuse the pages of the latter by interlineations. At the beginning of the quarter, when the names of the consumers are all written out, and before the "previous states" have been brought forward, "states" from the removals book are all carefully transferred to their respective places in the register, a distinguishing mark being made opposite each, and the removals account for that quarter is then closed.

Mr. GODDARD inquired whether Mr. Newbigging dispensed with the ledger altogether, or whether he posted from this form into the ledger.

Mr. NEWBIGGING said he dispensed with the ledger altogether; this register was a ledger in itself.

Mr. WOOD, of Hastings, said he could fully endorse many of the remarks which were made by the writer, especially those relating to the importance of promptitude in getting out the accounts. Any plan which conduced to the collection of the gas-rental at the earliest possible period deserved the consideration of gas managers; and even if it involved the keeping of an extra clerk it might be well worthy of adoption. In the town from which he came there were frequent changes among the consumers, and there was nothing that people so freely left unpaid as their gas bills; and therefore promptitude in collecting the rental was an essential point. But with respect to book-keeping he might venture to suggest that there was nothing so good as simplicity. For many years he had endeavoured so to keep his accounts as that if he were to die suddenly, some one else could take his place at once and carry on the concern without interruption.

March Quarter, 1865.

State of Meter, Mar. 25, 1865.	State of Meter previous Quarter.	Gas consumed at 5s. p. 1000 Cubic Ft.	Quarter's Gas Rental.	Meter-Rent.	Arrears.	Total due March 25, 1865.	Date of Payment. 1865.	Discount.	Amount Paid. April.	Amount Paid. May.	Amount Paid. June.	Allowances Overcharges, &c.	Progressive. No.	Name.
6 5	3 1	3 4	. 17 .	. 7½	. 12 6	1 10 1½	20				1 10 1½		651	William Rose.
4 2	2 0	2 2	. 11 .			11 .	19	1 4½	. 9 7½				2	John Wilson.
28 7	18 4	10 3	2 11 6			2⁸ 11 6	18	6 5	2 5 1				3	Richard Finch.
1 5	0 1	1 4	. 7 .	. 7½	. 4 .	11 7½	16			. 7 7½			4	Abel Jackson.
10 7	7 9	2 8	. 14 .	. 7½		14 7½	19	1 9	. 12 10½				5	Robert Andrews.
19 3	14 5	4 8	1 4 .	9		1 4 9	27	3 .	1 1 9				6	Thomas Smith.
5 4	2 1	3 3	. 16 6	. 7½		17 1½	29	2 0½	. 15 1				7	William Brown.
8 0	6 0	2 0	. 10 .	. 7½		10 7½	23			. 10 7½			8	Samuel Hudson.
1 2	0 8	0 4	. 2 .	. 7½		2 7½	24			. 2 7½			9	Peter Robinson.
7 3	4 6	2 7	. 13 6	. 7½	. 5 .	19 1½	26				. 19 1½		660	Arthur Boys.
6 9	3 9	3 0	. 15 .		. 17 6	1 12 6	24				1 12 6		1	Robert Jones.
4 8	2 3	2 5	. 12 6	. 7½		13 1½	18			. 9 1½			2	Abram Walsh.
3 1	1 1	2 0	. 10 .			10 .	31			. 10 .			3	Andrew White.
9 4	7 2	2 2	. 11 .	. 7½		11 7½	20	1 4½	. 10 3				4	Joseph Gibson.
5 6	4 0	1 6	. 8 .	. 7½		8 7½	26	1 .	. 7 7½				5	Alexander Jervis.
10 8	8 3	2 5	. 12 6			12 6	27			. 9 .			6	Thomas Baker.
2 5	0 4	2 1	. 10 6	. 7½		11 1½	25	1 3½	. 9 10				7	R. Johnson.
4 1	2 2	1 9	. 9 6	. 7½		10 1½	29			. 10 1½			8	William Black.
3 8	1 4	2 4	. 12 .	. 7½	. 15 .	1 7 7½	28			1 . 7½			9	Edward Cave.
2 7	0 9	1 8	. 9 .	. 7½		9 7½	24	1 1½	. 8 6				670	John Foster.
146 5	91 2	55 3	13 16 6	9 6	2 14 0	17 0 .		19 4½	7 0 7½	3 19 9	4 1 9			

A great number of questions were put to Mr. Newbigging upon matters of detail in the working out of his plan, the general principle of which seemed to commend itself to the approval of the members.

Mr. WOODALL said he had adopted Mr. Newbigging's plan, only that at the top of the page he put the name of the street, and then the names of the customers were placed in the order which the number of their houses occupied. He also put twelve months accounts on the two pages instead of six. In the first column he had a double line, so that the last state of the meter appeared under that of the present, and the subtraction appeared in the second column.

Mr. WOOD, of Bury, said about twelve months ago he adopted the plan of posting the cash into two columns, as Mr. Newbigging did, and he had found it answer very well, though his company had over 6000 customers.

After some remarks by Mr. Longworth, of Dukinfield, Mr. Broadhead, of Grimsby, Mr. Braddock, of York, Mr. Paterson, and Mr. Fraser, a vote of thanks to Mr. Newbigging was adopted.

The CHAIRMAN announced that he had received a communication from Mr. Young, the engineer of the Birmingham and Staffordshire Gas Company, saying, that he should be glad to show the members of the association over their works at such time on the following day as might be most convenient. He had also received a letter from Mr. James Russell, of Wednesbury, who was manufacturing tubes by means of Mr. Siemens's furnaces, inviting the members to inspect his premises. They would there have the opportunity of seeing how Mr. Siemens proposed to manufacture gas. It was made on his plan there, and was to heat the furnaces by means of which the tubes were welded. A further communication had been received from Messrs. Messenger, offering to the members an inspection of their gas-fitting manufactory, and a verbal communication had been made by Mr. White, the engineer of the Birmingham Gas Company inviting them to inspect their works.

On the motion of Mr. GODDARD, seconded by Mr. BRADDOCK, a very cordial vote of thanks was presented to Thomas Hawksley, Esq., the president of the association, which having been briefly acknowledged, the meeting adjourned.

At the evening sitting the president announced that Messrs. Winfield and Co. had written, inviting the members to inspect their large manufactory. He then introduced Dr. Letheby, who delivered the following lecture:—

ON THE PRESENT STATE OF THE CHEMISTRY OF GAS LIGHTING.

By HENRY LETHEBY, Esq., M.B.

Gentlemen,—I propose that we should continue to-night our inquiries into the chemistry of gas lighting—that, in fact, we should extend our investigation into the subject which was commenced at the meeting of this association last year, at Manchester, when, as some of you will remember, I directed your attention to the chemical principles involved in the manufacture and purification of coal gas. On the present occasion we will examine the leading physical, chemical, and photometrical properties of the most important constituents of coal gas.

Briefly to recapitulate the subject of the last lecture, I may remind you that we inquired, in the first place, into the composition and probable origin of the material out of which gas is produced—coal; that we then examined the leading constituents of the several varieties of coal which are best suited for the manufacture of gas, especially directing attention to the form in which the most objectionable impurity (sulphur) of coal existed. We also considered the phenomena of carbonization or distillation of coal, and saw how much it was influenced by temperature, and how, under the influence of heat, the elements moved from their old states of combination into new.

We then discussed the composition of raw gas as it leaves the retort, and I pointed out to you that it consists of the constituents marked in the following table:—

Constituents of Raw Gas.

Tar matter.
Aqueous vapour.
Carbonic acid.
Ammonia.
Cyanogen.
Sulpho-cyanogen.
Sulphuretted hydrogen.
Bisulphide of carbon.
Sulpho-hydrocarbons.
Nitrogen.
Oxygen.

Hydrogen.
Light carburetted hydrogen.
Carbonic oxide.
Condensable hydrocarbons.

Now the whole of these constituents above the line may be regarded as impurities, and I pointed out to you that the taking of these impurities out of coal gas, in order to effect the perfect removal of them, involved a proper order, as it were, of purification—that, in the first place, both science and practice pointed to the fact that the condensation or cooling of the gas should not be too sudden; that the longer the gas was kept in contact with tar and ammoniacal liquor before it went to the condensers the better. It had been seen in numerous instances that a long hydraulic main, extending a considerable distance from the retorts, always effected the condensation of naphthaline, as well as objectionable sulphur compounds; and I further pointed to the fact that when the gas had traversed the condensers, it was never properly purified if it left them at a higher temperature than 60° Fahr. The aim, in fact, should be *slow but complete condensation by gradual cooling*; for if the temperature of the gas exceeded 60°, the ammoniacal liquor was never of its full strength; and much sulphur, ammonia, carbonic acid, and aqueous vapour passed on to the purifiers, where such impurities were seriously in the way.

The next question is how to remove from the gas the sulphuretted hydrogen, the ammonia, and the other impurities which still remain in it. In continuation of the system already adverted to, it is well to submit the gas to the action of a copious stream of ammoniacal liquor after it leaves the purifiers. As far back as the year 1846, Mr. Lowe directed attention to this, and he patented a process for effecting it. Very recently Mr. Hawksley has, from independent observations, and from a chemical consideration of the subject, recommended a like process.* He advises that the gas should be drenched with ammoniacal liquor to the extent of a sixteenth of the volume of the gas. The effect of this is to strengthen the liquor and to remove from the gas ammonia, sulphuretted hydrogen, carbonic acid, and the objectionable compounds of sulphur with carbon, and the hydrocarbons. In practice it is found that the gas thus treated never contains more than 12 grains of sulphur in any form in 100 cubic feet—the average being about 9½ grains; and, to use the words of your president, "it thus appears that all considerable gas companies may, by a very simple, and in other respects very useful process, remove a large proportion of the objectionable sulphur compounds which usually continue to exist in coal gas after it has been passed through lime or other metallic oxide."

The residual impurities—namely, the ammonia, sulphuretted hydrogen, and carbonic acid, are next to be removed in proper order. Washing the gas with water, or with weak ammoniacal liquor and finally with water, will at once abstract a considerable amount of all these impurities; and although there is a prejudice with some engineers that this kind of purification is objectionable on account of its lowering the illuminating power of gas, yet, as we shall see hereafter, the prejudice is not founded on fact—excepting that the process undoubtedly removes such compounds as tar and naphthaline, which, though of high illuminating power, are nevertheless better out of the gas than in it, seeing how much mischief they do by subsequent deposition in the mains and service-pipes. You will have an opportunity of seeing, at the Saltley station of the Birmingham and Staffordshire Gas Company, in this town, the good effect of thoroughly washing the gas with water or weak ammoniacal liquor before it passes to the purifiers. Mr. Young, the experienced engineer of the company, has for some time past adopted this practice. The gas, on leaving the condensers, traverses successively three washers, or, as they may be more properly called, douche scrubbers; each of them is 25 feet high, 8 feet long, and 4 feet wide; and the liquor or water is delivered into them at the rate of 1815 gallons an hour, the gas passing at the rate of about 66,000 cubic feet an hour. The water or liquor flows through a pipe or jet with a very small orifice, and dashing upon a disc immediately below it, is splashed out into a fine shower which meets the ascending gas. The rate of flow, therefore, is about 27½ gallons for every 1000 cubic feet of gas. In this manner the gas is thoroughly cleansed before it goes to the purifiers, and the contrivance is such that no pressure is put upon the gas, for it passes through the washers without friction. The quantity of ammoniacal liquor which is thus obtained amounts to 44 gallons per ton of Staveley coal, the strength of the liquor being 4 of Twaddle, or about 8 ounces of sulphuric acid. Before this process was adopted, the quantity of liquor of the same strength was only 25 gallons per ton; and the profit arising from the sale of the liquor is more than £2000 per annum in excess of the former returns. I find, from an examination of the gas, that its illuminating power is from 15 to 16 sperm candles of standard quality, and that there is no loss of power by deposition in the mains—the gas, indeed, is absolutely free from ammonia, naphthaline, and carbonic acid, and the amount of sulphur in any form does not exceed 16 grains per 100 cubic feet. When the gas has been thus washed, it contains but little ammonia, so that a tray of acid sawdust in the purifier remains for months without being saturated. After this complete removal of ammonia, the gas should be submitted to the action of wet lime, or, failing this, on sanitary grounds, to oxide of iron; and lastly to a few trays of dry lime to remove carbonic acid, which, as I shall show you directly, is a very objectionable constituent of gas, on account of its lowering the illuminating power.

The order then of purification is:—1st, slow but complete cooling; 2nd, washing with ammoniacal liquor; 3rd, the removal of ammonia by water or acid; 4th, the abstraction of sulphuretted hydrogen by lime or oxide of iron; and 5th, carbonic acid. I have been particular in recapitulating all this because of its great importance in the manufacture of good gas.

We will now pass on to the proper subject of the lecture, namely, the examination of the chief constituents of purified coal gas. These may be classed under three heads:—

1. *The combustible non-illuminating constituents.*
2. *The illuminating hydrocarbons.*
3. *The impurities.*

1. *The Combustible Non-Illuminating Constituents of Coal Gas.*

These form a very large proportion of its bulk—as from 30 to nearly 60 per cent. They are hydrogen and carbonic oxide; and their sole function seems to be the purveying or carrying the illuminating hydrocarbons.

(a) HYDROGEN (H) exists in coal gas to the extent of from 12 to nearly 50 per cent. It is in greatest abundance in poor gas of low illuminating power, and it no doubt comes in great part from the decomposition of the richer hydrocarbons by the high temperature of the retorts. It is also produced by the moisture of the coal giving up its oxygen to the red-hot carbon, and setting free its hydrogen. The gas is singularly inert—it has no colour, no taste, no odour, and no action on the human body. It is the lightest body known—its specific gravity being 0·0692, atmospheric air being 1; and 100 cubic inches of it weigh only 2·15 grains, the same quantity of air weighing 31 grains. It burns without any light; and, as you perceive when I hold a cold glass over the flame, the product of its combustion is water. One cubic foot of hydrogen requires half a cubic foot of oxygen, or 2½ cubic feet of atmospheric air, for combustion. The temperature of the flame is very high—about 5898° Fahr., and a cubic foot of the gas, in burning, will raise 5220 ounces of water, or 16,250 cubic feet of air, 1° Fahr. Lastly it is but slightly absorbed by water—100 volumes of water taking up about 1·93 of hydrogen gas; and it is not condensable by cold or pressure.

(b.) CARBONIC OXIDE (CO) is a compound of one proportion of carbon, and one of oxygen. By weight, therefore, it consists of 6 parts of carbon and 8 of oxygen; and by volume, of half a volume of carbon vapour and half a volume of oxygen, united without any condensation. It is not a large constituent of coal gas, the proportions ranging from about 5 to 16 per cent.; but it forms a considerable part—about 34 per cent.—of the gas made by the decomposition of steam by red-hot carbon. This, indeed, is the chief source of it in common coal gas. Like hydrogen, it is colourless and odourless; but unlike it, it is a deadly poison. I have ascertained that 2 per cent. of it in air will kill birds almost instantly; and, according to Leblanc and Dumas, an atmosphere containing one per cent. of it will kill a small dog in a minute and a half. It is a little lighter than atmospheric air, in the proportion of 0·967 to 1; and 100 cubic inches of it weigh nearly 30 grains. It burns with a pale bluish and somewhat opaque flame; and, as you here see, it forms nothing but carbonic acid. The flame cannot be got from the small jet over the governor. I am obliged to burn the gas from a very large jet over the pneumatic trough, and therefore I am not able to show you the size of its flame in comparison with coal gas. In the act of burning, 1 cubic foot of carbonic oxide consumes half a cubic foot of oxygen, or 2½ cubic feet of air; and the heat of the flame is very nearly as great as that of hydrogen, it being 5508° Fahr. A cubic foot of it will raise the temperature of 5400 ounces of water, or 16,500 cubic feet of air, 1° Fahr. It is but slightly absorbed by water—100 volumes absorbing 2·43 volumes—but it is very

* JOURNAL OF GAS LIGHTING, Vol. XIII., p. 542.

freely absorbed by a strong solution of sub-chloride of copper; and this is the agent used for its detection in coal gas.

2. *The Illuminating Constituents (Hydrocarbons) of Coal Gas.*

These are all compounds of carbon and hydrogen; hence their name, hydrocarbons. And as, in the same volume of the gas, there are very different proportions of carbon, the illuminating power of these several constituents varies considerably. In all cases the light which they evolve in the act of burning is due to their decomposition by the heat of the flame, and to the suspension of the liberated carbon for a definite time in an ignited state.

The following are the principal members of this group, beginning with the least illuminating:—

Marsh Gas, $C_2 H_4$; Olefiant Gas, or Ethylene, $C_4 H_4$; Propylene, $C_6 H_6$; Butylene, $C_8 H_8$; Acetylene, $C_4 H_2$; Benzole, $C_{12} H_6$; Naphthaline, $C_{20} H_8$, and perhaps some others.

(a) Marsh Gas is also called *Pit Gas*, *Fire-damp*, *Light Carburetted Hydrogen*, and *Hydride of Methyl* ($C_2 H_4$). A volume of the gas contains half a volume of carbon vapour, and two volumes of hydrogen. It is a large constituent of the gas evolved from sewage, and the mud of a stagnant pool. It also forms from 79 to 91 per cent. of the fire-damp of coal mines, and it constitutes from 30 to 60 per cent. of coal gas. It is colourless, odourless, tasteless, and without action on the animal body, for miners breathe it with impunity. It is a little more than half the weight of atmospheric air—its specific gravity being 0·5531; and, therefore, 100 cubic inches of the gas weigh 17·15 grains. It burns, as you perceive, with a pale yellow flame, which is bluish for a considerable distance up, the height of the jet being somewhat less than that of coal gas; and so also is its illuminating power. A cubic foot of gas consumes 2 cubic feet of oxygen, or 10 cubic feet of air; and the products of the combustion are a cubic foot of carbonic acid, and aqueous vapour. The heat of the flame is about 5890° Fahr., and a cubic foot will raise 16,920 ounces of water, or 52,000 cubic feet of air, 1° Fahr. The gas is but slightly absorbed by water—100 volumes taking up 3·91 of the gas. It is not absorbed by chlorine, except after some time, and in the light; nor by bromine or fuming sulphuric acid; and it is not easily decomposed by heat; nor is it condensed by cold. There is no immediate test for the gas.

Besides marsh gas, there are probably other members of the series present in coal gas, as *Ethyl-hydride* ($C_4 H_6$), *Propyl-hydride* ($C_6 H_8$), *Butyl-hydride* ($C_8 H_{10}$), and *Amyl-hydride* ($C_{10} H_{12}$), all of which are found in the petroleums of commerce.

(b) Olefiant Gas, Ethylene, or Elayl ($C_4 H_4$) is a gas which contains twice as much carbon in a given volume as the last—a volume of it contains its own bulk of carbon vapour and two volumes of hydrogen. It exist in fire-damp to the extent of from 2 to 16 per cent., and in coal gas to from 3 to 27 per cent., cannel gas containing it in the largest proportion. It is colourless, and, when pure, is a little ethereal or sweetish in its odour, and it is anæsthetic or stupifying in its action on the body when it is inhaled. It is very nearly as heavy as atmospheric air—its gravity being 0·967; and, therefore, 100 cubic inches of it weigh nearly 30 grains. It burns with a long, bright yellow flame, the illuminating power of which is fully twice as great as the last. A cubic foot of the gas requires 3 cubic feet of oxygen, or 15 cubic feet of air for its combustion, and it produces 2 cubic feet of carbonic acid, and much aqueous vapour—evolving about one-third more heat than the last. When mixed with twice its volume of chlorine gas and fired, its hydrogen is consumed, and its carbon is deposited in the form of soot. It is also slowly absorbed by chlorine, in the dark as well as in the light, forming a heavy oily liquid of an ethereal odour, called Dutch liquid ($C_4 H_4 Cl_2$). In like manner it is absorbed by bromine, and by fuming sulphuric acid. The gas is slightly soluble in water, to the extent of about one-eighth of its volume, and it is freely soluble in alcohol, ether, volatile oil, and fixed oil. Turpentine, for example, will take up twice and a half times its volume of the gas, and olive oil will absorb its own volume of it. It is easily decomposed by heat—a red heat converting it into carbon and marsh gas, together with a small quantity of tarry matter; and the gas is condensable by great cold and by pressure. The test for the gas is bromine or fuming sulphuric acid, which freely absorb it.

(c) Propylene, or, as it is sometimes termed, *Tritylene* ($C_6 H_6$), is a compound of carbon and hydrogen in the same per centage proportions by weight as the last; but a volume of it contains 1½ volume of carbon vapour and 3 volumes of hydrogen. Its proportion in coal gas has not been accurately determined. It is colourless, and has a stupifying action on the body. It is just half as heavy again as atmospheric air—its specific gravity being 1·455; and, therefore, 100 cubic inches of it weigh about 45 grains. It burns with a bright yellow and somewhat sooty flame, which is fully three times as long as the comparison jet of coal gas burning from the same sized orifice, and under the same pressure; and the light evolved from it is about three times as great as that from common coal gas. A cubic foot of it requires 4½ cubic feet of oxygen, or 22½ cubic feet of air, to burn it; and it produces 3 cubic feet of carbonic acid, and much aqueous vapour. The heat evolved by it is also very great. It is but slightly absorbed by water, but it is freely absorbed by chlorine, bromine, and iodine, forming compounds which correspond to Dutch liquid. It is also absorbed by fuming sulphuric acid, and even by strong oil of vitriol. The volatile and fixed oils dissolve it, and so also does a solution of proto-chloride of copper. As in the last case, it is readily decomposed by a red heat, forming marsh gas, and depositing carbon; and it is also condensed by cold and pressure.

(d) Butylene, Tetrylene, Diteteyl, or *Oil Gas* ($C_8 H_8$), is a still further condensation of carbon and hydrogen in the same per centage weights as in olefiant gas. A volume of butylene contains two volumes of carbon vapour and four of hydrogen. It is a large constituent of oil gas, and it exists in cannel gas to the extent of about from 3 to 4 per cent. Common gas contains it in very small proportions. The gas is colourless, and it has a peculiar odour. Its action on the body is not known, but no doubt it is anæsthetic, like the other hydrocarbons of this series. It is nearly twice as heavy as atmospheric air—its gravity being 1·935; and, therefore, 100 cubic inches weigh just 60 grains. It burns, as you perceive, with a long sooty flame—the jet being nearly four times as long as the comparison jet of coal gas; and the illuminating power of it is about four times as great as the jet of common gas. A cubic foot of the gas requires 6 cubic feet of oxygen, or 30 cubic feet of air, to burn it; and the products of its combustion are 4 cubic feet of carbonic acid, and much aqueous vapour. Like the other hydrocarbons, it is but slightly soluble in water, but it is freely dissolved by alcohol and by the fixed and volatile oils—olive oil, for example, absorbs about six times its volume of the gas. It is also absorbed by chlorine and bromine, forming compounds analogous to Dutch liquid; and it is likewise freely absorbed by sulphuric acid—a volume of the acid taking up 100 volumes of the gas. If it is passed through a red-hot tube, it is decomposed and resolved into marsh gas, hydrogen, and carbon. It is also easily condensed by cold and pressure, forming a thin, transparent, and colourless oil, of which I show you a specimen. In the days of oil gas, when the Compressed Gas Company was in existence, this ethereal oil was produced in rather large quantity—1000 cubic feet of the gas submitted to a pressure of 30 atmospheres, produced about a gallon of oil, composed almost entirely of butylene, with benzole and an oil of doubtful composition. It was from this mixture that Faraday obtained butylene.

(e) Acetylene, or Klumine ($C_4 H_2$). A volume of this gas contains its own volume of carbon vapour and one volume of hydrogen. The gas exists in but very small proportions in coal gas; and it is remarkable as being a hydrocarbon which can be obtained by the direct union of carbon with hydrogen, by igniting carbon, by the aid of electricity, in an atmosphere of hydrogen. It can also be obtained by exposing a mixture of carbonic oxide and marsh gas to the action of a high temperature—a circumstance which may hereafter be of practical utility in the manufacture of gas. It is likewise a product of the decomposition of hydrocarbons by heat. The gas is colourless, with a peculiar odour, and it is probably anæsthetic. It is a little lighter than air—the specific gravity of it being 0·898; 100 cubic inches, therefore, weigh just 28 grains. It burns with a brilliant light, as you here perceive, and with a sooty flame, considerably longer than the flame of coal gas; and when I mix it with a large volume of hydrogen gas it still burns with a bright flame. A cubic foot of the gas requires 2½ feet of oxygen, or 12½ feet of air, to burn it; and it produces two volumes of carbonic acid, and aqueous vapour. The gas is freely absorbed by water, to the extent of its own bulk, and it is again expelled unchanged when the water is boiled. It also combines with great energy with chlorine, bromine, and sulphuric acid. The best absorbent for it is a solution of ammonio-sub-chloride of copper. The solution is made by mixing a dilute solution of chloride of copper with an equal bulk of pure muriatic acid, and shaking the mixture in a bottle with copper filings, or boiling it with copper turnings until it is colourless. The solution is then put into a bottle or flask, with three tubes adapted to it; one for delivering the coal gas into the solution, a second for the exit of the gas, and the third for pouring in a strong solution of ammonia. When the gas has displaced all the air from the bottle, ammonia is poured into the solution until a deep blue liquid is obtained; and this, as you here see, absorbs the acetylene of the gas, and produces a chocolate or reddish brown precipitate of acetylide of copper ($C_4 H_1 Cu_2$), which is a compound in which two proportions of copper have replaced one of hydrogen. This acetylide of copper is to be collected on a filter, washed with water, and dried. If it is heated in a flask, as I am now doing, with dilute muriatic acid, it is decomposed, and the acetylene escapes with effervescence. You will notice, too, with what a bright yellow flame the gas burns.

(f) Benzole, or, as it is sometimes termed, *Benzine*, *Phene*, or *Bicarburetted Hydrogen* ($C_{12} H_6$). One volume of this vapour contains three volumes of carbon vapour and three of hydrogen. It exists in coal gas in very variable proportions. At times it is but barely discoverable, and at other times it is present in large quantity. It is often present in London gas to a considerable extent, and I attribute it to the practice which is occasionally followed, of pouring light naphtha into the mains for the purpose of removing naphthaline. I here show you a specimen of nitro-benzole obtained from only 15 cubic feet of gas. The vapour of benzole is colourless, and it has a peculiar odour, which is rather agreeable when the benzole is pure. It is powerfully anæsthetic, and will cause fatal insensibility if it be inhaled too copiously. The vapour is about 2¾ times as heavy as atmospheric air—its specific gravity being 2·695; 100 cubic inches of it will, therefore, weigh 84 grains. The vapour burns with a very bright light—so much so that I have no difficulty in giving a strong illuminating power to hydrogen by merely passing the gas through a tube containing a little tow moistened with benzole. This is a good example of the naphthalization of gas; and I have here another instance of it, where common coal gas is passing over the benzole contained in a proper naphthalizer. You perceive the extraordinary richness of the light. Experiments have been made for the purpose of determining the value of the light for the benzole or naphtha consumed; and the results are, that every grain of the vapour taken up by a foot of common 12-candle gas increases its light about 10 per cent. The various naphthas of commerce are more or less charged with benzole and its homologues, and they raise the illuminating power of gas from 4½ to 8 per cent. for each grain of the vapour absorbed by the gas. In the act of burning, a cubic foot of benzole vapour consumes 7½ cubic feet of oxygen, or 37½ cubic feet of air; and it produces 6 cubic feet of carbonic acid, and much aqueous vapour. The heat of the flame also is considerable. Benzole is but slightly absorbed by water, but it is freely taken up by alcohol, ether, and the volatile and fixed oils. It is also, like the other rich hydrocarbons, absorbed by vulcanized tubing The vapour is slowly condensed by chlorine and bromine in the sunlight, and compounds are formed containing six proportions of the halogens ($C_{12} H_6 Cl_6$, and $C_{12} H_6 Br_6$), which present a certain analogy to Dutch liquid. Sulphuric acid also absorbs the vapour, and forms conjugate acids; but the most interesting product of benzole is its substitution compound with peroxide of nitrogen, which is produced when it is brought into contact with strong nitric acid. This, indeed, is the test for benzole; so that, if coal gas is passed through fuming nitric acid, as you here see, the benzole vapour is absorbed, and an oily liquid is produced, which has the odour of bitter almonds. This is easily purified by washing it with water, and finally with a weak alkaline solution. It is then called *Nitrobenzole*, or *Essence of Mirbane*. It is produced from benzole by the substitution of one proportion of peroxide of nitrogen for one of hydrogen ($C_{12} H_5 NO_4$); and I may remind you that, although it is used very largely in perfumery, it is a dangerous poison; I know instances where a few drops of it have produced fatal coma. Benzole vapour is decomposed by a red heat, forming a gaseous hydrocarbon, and depositing much carbon. It is also easily condensed by cold, when it forms an ethereal liquid, which freezes into a crystalline solid at 32°, and which boils at 177° Fahr. This liquid is lighter than water, and is remarkable for its solvent power for caoutchouc, gutta-percha, and all kinds of resins and fats.

(g) The other members of the benzole series, as *Toluole* ($C_{14} H_8$), *Xylole* ($C_{16} H_{10}$), *Cumole* ($C_{18} H_{12}$), and *Cymole* ($C_{20} H_{14}$), are no doubt also present in coal gas, for they are found in the naphtha distilled from coal tar; but as they are less volatile than benzole, they are present in smaller quantity.

(h) Naphthalin ($C_{20} H_8$) is the last of the hydrocarbons to which I shall refer. It is only present in gas which has been made at high temperature, and it is invariably a secondary product of the decomposition of the richer hydrocarbons (tar, &c.) by the walls of the red-hot retort. In London, where it is the practice to work at very high temperatures, the coal gas is always charged with naphthalin, and its presence in the mains is a serious inconvenience. The vapour of naphthalin is very rich in carbon—a cubic foot of it contains five times its bulk of carbon vapour, and four times its bulk of hydrogen. The specific gravity of the vapour is 4·422, and therefore 100 cubic inches of it weigh rather more than 137 grains. It burns with a bright sooty flame, and if I heat a little of the hydrocarbon in a flask, and pass hydrogen gas through it, you will see how richly it

naphthalizes the gas. In the act of burning, a cubic foot of the vapour consumes 12 times its volume of oxygen, 60 times its bulk of air; and it forms 10 cubic feet of carbonic acid, and aqueous vapour. Naphthalin is not absorbed by water, but it is by the volatile and fixed oils, and by naphtha and coal tar; hence the advantage of keeping the raw gas until it is thoroughly cooled in contact with tar and ammoniacal liquor in a long hydraulic main. Hence also the fact that the richer qualities of gas, containing much hydrocarbon, do not deposit naphthalin; and hence also the use of naphtha as a remedy for naphthalin in the mains and service-pipes. The vapour of naphthalin is absorbed by chlorine and also by bromine, the products being liquids which have considerable analogy to Dutch liquid. It is also absorbed by sulphuric acid. Naphthalin is not easily decomposed by heat; it is quickly deposited by cold, forming brilliant white scales, which have a tendency to collect in the bends of pipes, and wherever there is an impediment to the easy flow of the gas. These scales are slowly volatile at ordinary temperatures, they melt at a heat of 174° Fahr., and they boil at 428°.

And now, in reviewing the facts which have been brought before us in an examination of the properties of the several hydrocarbons found in coal gas, the conclusions are—

1. That they belong to different groups, or series of compounds, in which the proportions of carbon and hydrogen rise by successive increments of 2 + 2, and that the amount of hydrogen in them progressively decreases.

In the *Marsh Gas series*, for example, the proportion of hydrogen is always two more than the carbon, thus:—*Marsh gas*, or *Methyl-hydride*, $C_2 H_4$; *Ethyl-hydride*, $C_4 H_6$; *Propyl-hydride*, $C_6 H_8$; *Butyl-hydride*, $C_8 H_{10}$; *Amyl-hydride*, $C_{10} H_{12}$; &c., all of which are found in the petroleums.

In the next series, the *Alcohol radicals*, which may or may not be present in coal gas, the proportion of hydrogen is only one more than the carbon, thus:—*Methyl*, $C_2 H_3$; *Ethyl*, $C_4 H_5$; *Propyl*, $C_6 H_7$; *Butyl*, $C_8 H_9$; *Amyl*, $C_{10} H_{11}$; &c.

In the third series, which are the chief constituents of coal gas, the *Olefiant Gas series*, the proportions of carbon and hydrogen are equal, thus:—*Methylene*, $C_2 H_2$; *Ethylene*, $C_4 H_4$; *Propylene*, $C_6 H_6$; *Butylene*, $C_8 H_8$; *Amylene*, $C_{10} H_{10}$; *Caproylene*, $C_{12} H_{12}$; &c.

In the next compound, *Acetylene* $C_4 H_2$, it is two proportions less; and in the *Benzole series* it is six proportions less, thus:—*Benzole*, $C_{12} H_6$; *Toluole*, $C_{14} H_8$; *Xylole*, $C_{16} H_{10}$; *Cumole*, $C_{18} H_{12}$; *Cymole*, $C_{20} H_{14}$; &c.

And, lastly, in the *Naphthalin series* it is at least 12 proportions less.

2. We notice that the illuminating power of these hydrocarbons rises in proportion to the amount of carbon contained in a given volume of them—marsh gas being the weakest, and naphthalin the strongest.

3. We perceive that their weight, or specific gravity, rises with their photometrical value—marsh gas being only about half as heavy as atmospheric air (0·5531), and naphthaline 4½ times (4·422); so that, if accidental impurities were not present in coal gas, the specific gravity of it would furnish a good indication of its quality.

4. We remark that all the richer hydrocarbons, excepting acetylene and naphthalin, are easily decomposed by heat, carbon being deposited, and a weaker quality of gas, generally marsh gas, produced. It is manifest, therefore, that these important constituents of coal gas will not bear contact with the red-hot walls of the retorts; and the practical conclusion from it is that they should be swept out of the retorts as quickly as possible, and that the temperature of the retorts, especially of the upper parts, should be as low as possible; in fact, the destruction of these bodies is not by the temperature to which the coals are subjected, but by the heat of the upper parts of the retorts upon which the distilled gases and vapours impinge.

5. We have observed that with one exception (marsh gas) all these hydrocarbons are freely absorbed by chlorine, bromine, and strong sulphuric acid; and that in each case a very similar set of compounds is formed—Dutch liquor being the homologue of the haloid compounds. This indicates the difficulty of determining the photometrical value of gas by the amount of condensation with chlorine or bromine, for, by such a process, we have no knowledge of the particular hydrocarbon condensed. In my own experiments, I find that the condensation may be very different, even when the gases examined have the same illuminating power; and, conversely, we may have the same amount of condensation for gases of very different illuminating powers—the number, therefore, 3·25, which is sometimes taken as the coefficient of power, is altogether unreliable.

6. We notice that all the richer and more condensable hydrocarbons are condensable by cold, and, therefore, that gas should not be subjected to a cold of 32°, or even much below 50° Fahr.

7. It is a fact that water has little or no influence on any of the hydrocarbons, except acetylene; and, as this exists in gas only to a very small extent, there is little or no danger from a copious washing of the gas before it goes to the purifiers.

8. It is worthy of remark, that the hydrocarbons are freely absorbed by oils, and by vulcanized india-rubber tubing. This circumstance should be taken into account in testing the illuminating power of gas, for I find that a flexible tube, of about 30 feet in length, will reduce the power of a weak gas to the extent of nearly 25 per cent.

9. It is not an unimportant fact that these hydrocarbons consume very different proportions of oxygen, and, therefore, vitiate very different proportions of atmospheric air; and again, the explosive power of coal gas, when mixed with air, is much affected by the proportions of the richer hydrocarbons present. The explosive power of hydrogen, when mixed with its proper proportion of oxygen and fired, is about 26½ atmospheres; of marsh gas about 38 atmospheres; of olefiant gas nearly 44½ atmospheres; of propylene about 66 atmospheres; and butylene nearly 89 atmospheres; common coal gas, in exploding with its proper proportion of oxygen exerts a pressure of about 34 atmospheres on the walls of the containing-chamber; and the proportion of air which is capable of giving the strongest explosion is 6½ times the bulk of the gas.

In order that the leading properties of the several combustible constituents of coal gas may be seen at a glance, I will direct your attention to this diagram, where I have tabulated not only the known constituents of gas, but also some of their allies, as the alcohol radicals, as they are sometimes called, which occupy an intermediate place between the marsh gas and the olefiant gas series of compounds. You will here see how in each series the proportions of carbon and hydrogen progressively increase in the same volume of gas or vapour, and how also the specific gravity of the gas likewise increases; and so also does its illuminating power, and its vitiating effect on the atmosphere. In this last respect I have considered that 4 per cent. of carbonic acid in the air renders it irrespirable. You will also note the proportions in which the several compounds are absorbed by water.

Principal Constituents of Coal Gas, and their Allies.

	Name.	Symbol or Formula.	1 Volume contains		Specific Gravity of Gas or Vapour.	Weight of a Cubic Foot (Grains).	Volumes Soluble in 100 Vols. of Water.	Volumes of Oxygen to burn.	Product of 1 Volume.		Volumes of Air vitiated by 1 Vol.
			Vol. C.	Vol. H.					Vol. CO_2.	Vol. HO.	
	Hydrogen	H	0·0	1·0	0·069	37·1	1·93	0·5	0	1	2·5
	Carbonic oxide	C O	0·5	0·5(0)	0·967	519·2	2·43	0·5	1	0	27·5
Marsh gas series	Methyl-hydride	$C_2 H_4$	0·5	2·0	0·553	296·9	3·91	2·0	1	2	35·0
	Ethyl-hydride	$C_4 H_6$	1·0	3·0	1·037	556·8	0·50	3·5	2	3	67·5
	Propyl-hydride	$C_6 H_8$	1·5	4·0	1·520	816·2	0·00	5·0	3	4	100·0
	Butyl-hydride	$C_8 H_{10}$	2·0	5·0	2·004	1076·1	0·00	6·5	4	5	132·5
	Amyl-hydride	$C_{10} H_{12}$	2·5	6·0	2·488	1336·0	0·00	8·0	5	6	165·0
Alcohol Radicals	Methyl	$C_2 H_3$	1·0	3·0	1·037	556·8	5·08	3·5	2	3	67·5
	Ethyl	$C_4 H_5$	2·0	5·0	2·004	1076·1	2·15	6·5	4	5	130·0
	Propyl	$C_6 H_7$	3·0	7·0	2·971	1595·3	0·00	9·5	6	7	197·5
	Butyl	$C_8 H_9$	4·0	9·0	3·939	2115·1	0·00	12·5	8	9	262·5
	Amyl	$C_{10} H_{11}$	5·0	11·0	4·906	2634·3	0·00	15·5	10	11	327·5
Olefiant gas series	Methylene	$C_2 H_2$	0·5	1·0	0·485	260·4	0·00	1·5	1	1	32·5
	Ethylene	$C_4 H_4$	1·0	2·0	0·970	520·8	16·15	3·0	2	2	65·0
	Propylene	$C_6 H_6$	1·5	3·0	1·455	781·2	0·00	4·5	3	3	97·5
	Butylene	$C_8 H_8$	2·0	4·0	1·940	1041·6	0·25	6·0	4	4	130·0
	Amylene	$C_{10} H_{10}$	2·5	5·0	2·425	1302·0	0·00	7·5	5	5	162·5
	Acetylene	$C_4 H_2$	1·0	1·0	0·898	482·2	100·00	2·5	2	1	62·5
Benzole series	Benzole	$C_{12} H_6$	3·0	3·0	2·695	1471·3	0·80	7·5	6	3	187·5
	Toluole	$C_{14} H_8$	3·5	4·0	3·179	1707·0	0·00	9·0	7	4	220·0
	Xylole	$C_{16} H_{10}$	4·0	5·0	3·662	1966·3	0·00	10·5	8	5	252·5
	Cumole	$C_{18} H_{12}$	4·5	6·0	4·146	2226·2	0·00	12·0	9	6	285·0
	Cymole	$C_{20} H_{14}$	5·0	7·0	4·630	2486·1	0·00	13·5	10	7	317·5
	Naphthalin	$C_{20} H_8$	5·0	4·0	4·422	2374·4	0·00	12·0	10	4	311·0

3. *Impurities, or Objectionable Constituents of Coal Gas.*

These are Carbonic Acid, Oxygen, Nitrogen, Ammonia, Sulphide of Carbon, Sulpho-hydrocarbons, Sulphuretted Hydrogen, Cyanogen, and Aqueous Vapour.

(a) *Carbonic Acid* (CO_2).—This gas is always produced in the retorts during the early stages of the carbonization of coal; and if the coals are very wet the quantity of the gas is increased by the action of the red-hot coke on the aqueous vapour—hydrogen and carbonic acid being produced. The amount of the gas is also augmented if the exhauster draws air through the pores or fissures of clay retorts. This gas consists of carbon and oxygen in such proportions that a volume of it contains half a volume of carbon vapour and a volume of oxygen. The gas is heavier than air in the proportion of 1·5202 to 1; and it is not only incombustible, but it also checks the combustion of other gases. A taper is immediately extinguished in air containing 14 per cent. of carbonic acid; and it burns very dimly, and only for a short time, in air containing 12 per cent. of the gas. Even detonating gas (a mixture of oxygen and hydrogen in proper proportions) will not explode when it is mixed with 2·89, or a little less than three times its volume, of carbonic acid. The effect of the gas in reducing the illuminating power of coal gas is very marked. You will observe this in the experiment which I will now make. Here is the standard flame of the burning gas, and when I introduce about 3 per cent. of carbonic acid into the gas, you will notice how seriously the power of the light and the volume of the flame are diminished. My own experiments have led me to the conclusion that 1 per cent. of carbonic acid in common coal gas will diminish the light about 5 per cent.; and that 2 per cent. of it in gas will reduce the power of 14-candle gas to about 12·5. In the case of the jet, a mixture of 5 per cent. carbonic acid reduces the light to half. It is, therefore, a serious impurity, and should always be removed from gas. This is easily accomplished, for carbonic acid is soluble at common temperatures, in its own volume of water, and alkalies absorb it very freely. Caustic lime, for example, will take up nearly its own weight of the gas; and, as I have already said, the purification should always be so managed that lime is the last agent through which the gas passes on its way to the holders.

Another objectionable property of carbonic acid is its action on the animal system. In its concentrated state the gas is absolutely irrespirable, and it kills immediately by causing spasm of the glottis. Even when it is diluted with air to the extent of 1 in 10, it quickly produces insensibility, and an atmosphere containing only 4 per cent. of it is dangerous. This is the proportion found in the air expired from the lungs; and therefore I have used it in the diagram just referred to as the proportion which renders air irrespirable. As little, indeed, as 2 per cent. of the gas in air will cause distress, as headache, and great depression of the vital powers; and no doubt the discomfort which arises from the too liberal use of gas in badly-

ventilated rooms is in great part due to the carbonic acid produced by the burning gas. I have found by experiment that a small gas-stove in one of Phillips's baths, in my own bath-room, will charge the air so oppressively with carbonic acid as to render it almost irrespirable. On one occasion I detected 3·5 per cent. of carbonic acid in the air of the room; and I need not say that this is a dangerous quantity. It is therefore advisable that the products of the combustion of gas, when it is burned in large quantity, should be carried out of the room; and this precaution is applicable to every illuminating agent which vitiates the atmosphere, as you will see from this diagram:—

Relative Values of Illuminating Agents,

In respect of their Heating and Vitiating Effects on the Atmosphere, when burning so as to give the Light of 12 Standard Sperm Candles.

	Pounds of Water Heated 1° Fahrenheit.	Oxygen Consumed. Cub. Ft.	Carbonic Acid Produced. Cub. Ft.	Air Vitiated. Cub. Ft.
Cannel gas	1950	3·30	2·01	50·2
Common do.	2786	5·45	3·21	80·2
Sperm oil	2335	4·75	3·33	83·3
Benzole	2326	4·46	3·54	88·5
Paraffin	3619	6·81	4·50	112·5
Camphine	3251	6·65	4·77	119·2
Sperm candles	3517	7·57	5·27	131·7
Wax candles	3831	8·41	5·90	149·5
Stearic candles	3747	8·82	6·25	156·2
Tallow candles	5054	12·06	8·73	218·3

The mode of discovering the presence of carbonic acid in coal gas is very simple; for if the gas is passed through a little lime water it will render it milky, or if shaken with a solution of potash the amount of absorption indicates the proportion present.

(b) *Oxygen* (O). This comes from the too active operation of the exhauster, and the drawing in of air through the retorts. The mischievous influence of this gas on the illuminating power of coal gas will be seen from this experiment, where I will pass about 6 per cent. of air into the burning gas, and you will notice how seriously the light of the flame is destroyed. It has fallen, in fact, to about half its original power. The following are the proportions of light lost by different amounts of air in gas, supposing the light to be 100:—

	Light.
2 per cent. of air in gas	90
5 " "	70
7 " "	52
10 " "	34
20 " "	12
40 " "	1
50 " "	0

The test for the presence of oxygen in coal gas is a little pyrogallic acid, and in operating you will proceed thus: First, agitate a known volume of the gas with a strong solution of potash, and observe the loss of volume—that is, due to carbonic acid; then put into the potash solution, which is still in contact with the gas, a little pyrogallic acid, and again agitate. If oxygen be present, the solution will acquire a brown colour, and the further diminution of volume is due to the absorption of oxygen. I ought to say that the gas is heavier than air in the proportion of 1 to 1·1056; and 100 volumes of water will absorb about 2·99 volumes of it at common temperatures.

(c) *Nitrogen* (N) is another impurity derived from the air by the action of the exhauster. The gas has no very marked influence on the luminosity of the flame, beyond this—that, in expanding under the influence of the temperature of the flame, it cools it somewhat by abstracting heat; and another objection to it is its power of forming nitric acid when it burns with the gas. There is no ready test for the discovery of this gas. It is a little lighter than air—its specific gravity being 0·9713; and it is but feebly soluble in water—100 volumes taking up about 1·48 volume of the gas.

(d) *Ammonia* ($N H_3$). This is a product of the carbonization of the coal, and it may exist in the gas in a free state, or combined with carbonic acid. A volume of the gas consists of half a volume of nitrogen and one and a half volume of hydrogen. Its specific gravity is 0·5896, and its objectionable properties are that it attacks copper and brass fittings, and that in burning with the gas it forms nitric acid; and that it is a purveyor of naphthalin, and other heavy and fœtid hydrocarbons in coal gas. The gas is readily absorbed by water; at common temperatures water will take up about 727 times its volume of the gas. It is also absorbed by dilute acids, and by many neutral salts. There is, therefore, no difficulty in removing it from gas. The test for it is moistened turmeric paper, which becomes red in less than a minute when the gas contains no more than 1 grain of ammonia in 100 cubic feet.

(e) *Bisulphide of Carbon* ($C S_2$). This compound is almost invariably present in coal gas, and it is no doubt formed in the later stages of the distillation when the temperature is high, and when the sulphur liberated from the pyrites comes into contact with the incandescent coke. The vapour of bisulphide of carbon is very heavy—its specific gravity being about 2·6447; and its volatility is such that it cannot be condensed from gas by cold. It is not soluble in water, but it is freely dissolved by alcohol and ether, and by the volatile and fixed oils. When the vapour of sulphide of carbon is mixed with aqueous vapour, and passed through a red-hot tube, it is decomposed, and, by a mutual interchange of elements, the sulphur is converted into sulphuretted hydrogen, and the carbon into carbonic acid. It is also decomposed when it is passed over red-hot lime, or baryta, and when it is brought into contact with the peroxides of the metals—as of iron, manganese, and tin, in an ignited state; and, lastly, I may say that it is absorbed by sulphide of ammonium, and that it is decomposed by an alcoholic or aqueous solution of the alkalies in the presence of a salt of lead. All these reactions have been made the basis of inventions for the removal of bisulphide of carbon from coal gas. Thus the solution of it in oil is the property taken advantage of in the process of Schomberg, who proposes that the gas should be washed with oil. The decomposition of it at a red heat by steam is the recent suggestion of Mr. Lewis Thompson. The decomposition by ignited lime is the process of Mr. Bowditch; and its solution in ammoniacal liquor is the plan proposed by your president.* The absorption of it by an alcoholic solution of potash or soda is the patent of Dr. Stenhouse; and the decomposition of it by passing it through a solution of oxide of lead in soda is the process of Dr. Angus Smith. And, although none of these processes have been found to be absolutely effective in practice, yet they are all more or less so; and they point to the importance of removing, as far as possible, this objectionable impurity from coal gas; for, in the act of burning, the sulphur of the bisulphide is converted into sulphurous acid, and this by further oxydation, in the presence of moisture, soon becomes sulphuric.

The tests for the discovery of this compound in coal gas are very numerous, and are founded on the reactions before mentioned. Dr. E. Herzog, for example, recommends that the gas should be passed through a strong solution of ammonia in alcohol, to which a few drops of sugar of lead has been added; and, if the bisulphide be present, it will give an orange-red precipitate. Or the gas may be passed into an alcoholic solution of potash, which freely absorbs the bisulphide, and converts it into xanthate of potash, which produces, with a solution of copper, the characteristic yellow precipitate of xanthate of copper; and, when boiled with a little sugar of lead, it produces a brown or black precipitate. Dr. Hofmann's test for bisulphide is to pass the gas through an ethereal solution of *triethylphosphine*, which forms with it a compound that crystallizes in the form of little prisms of a splendid red colour. But the easiest mode of discovering its presence in coal gas, and also of determining its amount, is to burn the gas at the rate of 1 foot an hour from a Leslie burner, and to carry the products of combustion, together with ammonia, into a glass cylinder, where they are condensed, and where the sulphur is afterwards found as sulphate of ammonia. The proportion of sulphur thus discoverable in coal gas ranges from about 4 grains per 100 cubic feet, in the better kinds of cannel gas, to about 40 grains in the worse varieties of common London gas.

(f) *Sulpho-hydrocarbons.* The nature of these compounds has not been determined, but there is good reason for concluding that sulphur exists in coal gas in other forms than as sulphuretted hydrogen and bisulphide of carbon. As in the last case, however, the sulphur, whatever may be its form of combination, is discoverable by the combustion process.

(g) *Sulphuretted Hydrogen* (H S) is but rarely present in coal gas, and its proportion is never large. The test which is commonly used for its detection—namely, a little sugar of lead on paper—will discover the millionth part of this impurity.

(h) *Cyanogen* ($C_2 N$). This compound is found in but very small proportion in coal gas, although its presence is always indicated by the existence of sulpho-cyanogen in the water of the meters. It is a constant product of the carbonization of coals, and its proportion increases with the amount of nitrogen in the coal, and with the temperature at which they are distilled. Nearly the whole of the cyanogen is condensed in the hydraulic main, where it unites with sulphuretted hydrogen and ammonia, and forms sulpho-cyanide of ammonia—the compound which gives the rich blood-red colour to the persalts of iron. But a trace of the gas escapes condensation, and passes into the mains, where it forms, in like manner, the sulpho-cyanide. In its pure state, cyanogen is a colourless gas, with a very peculiar odour, and it is a deadly poison. It consists of a volume of nitrogen and a volume of carbon vapour condensed into one volume, and its specific gravity is 1·8006. It burns with a pale rose-coloured flame, and forms twice its own volume of carbonic acid. It is not easily absorbed by water, but it is more freely taken up by alcohol, ether, and volatile oils; and it is readily absorbed by alkalies and alkaline sulphides. It is this compound which, uniting with iron, forms prussian blue, and so gives the blue and bluish-green colour to the spent lime (blue billy). There is no ready test for the recognition of the very small proportion of cyanogen contained in coal gas; but if a large volume of gas be passed through a tube containing flints moistened with an alkali, and the flints be acidified, they will acquire a blue colour if iron be present, in consequence of the formation of prussian blue; or the liquid may be treated with a little sulphate of iron, and then acidified with sulphuric acid, when it will present a blue colour.

(i) The last impurity in coal gas is *Aqueous Vapour* (H O), the proportion of which varies with the temperature. It is rarely less than 200 grains, or about 1037 cubic inches, in 100 cubic feet of gas, and it rarely exceeds 600 grains, or 3111 cubic inches, in the 100 feet. The influence of this impurity is not very striking, although the tendency of it is to reduce the luminosity of the flame by decomposing the hydrocarbons in the burning gas.

There is one property of aqueous vapour which has not been sufficiently noticed, but which is the chief cause of the heat and discomfort so often experienced in a room where gas is largely consumed. The property which I allude to is that of absorbing the radiant heat from the burning gas, and so, by its distribution through the air, elevating the temperature of the room. When much aqueous vapour exists in the atmosphere—and, as you will see by the table already referred to, there is much of it produced by burning gas—there is not only an elevation of temperature by the absorption of the radiant heat from the gas-flame, but there is also a check to the natural evaporation from the surface of our bodies, and the perspiration collects as visible moisture. We, therefore, feel hot and uncomfortable. This is another reason why the products of the combustion of gas should be removed as speedily as possible from the room in which they are produced.

And now I have but little time left for the discussion of the second part of my subject—namely, the means to be used for the combustion of gas so as to secure the fullest amount of heat or light. I will, however, direct your attention to two or three experiments, which will illustrate the fact that the light of a flame is dependent on the number of minute solid particles within it, and on the intensity and duration of their ignition. On the one hand, if I take hydrogen gas, which contains no solid particles, and which produces no solid particles in the act of burning, it will give me a flame of no appreciable luminosity; but I can at once give light to the flame by sifting solid matter, as magnesia or lime, into it; or by dosing it with benzole, or any other volatile hydrocarbon which is rich in carbon. Again, I have here the oxyhydrogen flame; it is barely perceptible until I direct it on a piece of lime, and then the solid particles of the lime become intensely ignited, and a vivid light is the result.

On the other hand, if I destroy the solid particles of a bright flame its luminosity disappears. Let me blow air into gas, as I can easily do with this double jet, and you will perceive how completely the light is destroyed; but

* The suggestion originated with M. Ellissen, who, in his report of June 4, 1864, upon the sulphur compounds present in coal gas, observed that, "it seems of the greatest utility to keep as long as practicable the ammonia in contact with the gas; to repeat as often as practicable the workings in ammoniacal water in the scrubbers, and especially to avoid the use of acid substances which, in absorbing the ammonia too rapidly, set the sulphurous products at liberty; while their prolonged contact with ammonia would end by producing salts, which would deposit themselves in the condensing and purifying apparatus and in the pipes." Mr. Hawksley, in his letter of July 11, inserted in our columns on July 26, 1864, remarks that, "there is nothing new in this application of ammoniacal liquor as a washing agent; but, so far as I know, it was not till the report of Mr. Barlow and M. Ellissen had been considered by Dr. Letheby that the chemical action of crude ammoniacal liquor upon the bisulphide of carbon in coal gas (as an acid upon a base with the formation of a double salt) was recognized." We hope before long to be favoured with Mr. Hawksley's own experiments on the subject.—Ed. J. G. L.

the temperature of the flame is considerably increased, for I can now easily melt and burn iron with it.

The difference, therefore, which we perceive in the light evolved by different flames is entirely dependent on the different proportions of solid particles contained in them. This spirit of wine, and this sulphur burn with little or no light; but this phosphorus, and this magnesium burn with a vivid light; and the results in the latter case are due to the production of solid particles (phosphoric acid and magnesia), which are intensely heated. So again, the electric light is a stream of heated particles of carbon flowing from pole to pole. I have not time to enter on the question of the relative luminosity of these several flames, but you will perceive they are all very great; and the consideration which flows from it is, that when we wish to obtain the maximum amount of light from any quality of gas, the object should be to detain the particles of carbon in an ignited state as long as possible. This can only be accomplished by a proper adaptation of the supply of air; for if the supply be too great, the particles of carbon are too quickly burnt, and if it be too little, they escape unconsumed as smoke and the temperature of the flame is reduced. You will see, therefore, that there is no one burner which is suited for every quality of gas, unless, indeed, the supply of it to the burner is regulated. I have here a number of contrivances which have been invented for the purpose of increasing the illuminating power of a poor gas; but they are all contrivances for checking the supply of air to the flame, or for diminishing the too rapid outflow of the gas. I regret we cannot enter further upon this subject, and that I can only show you by this diagram, how much the form and measurement of the burner affect the quality of the light.

Illuminating Power of Common London Gas (13-*candle*), *when burned from different Burners.*

	Diameter of Internal Aperture.	Illuminating Power (Sperm 120).	Per Centage Difference.
Old brass burner, 15 holes	0·70 in.	11·30	100
do. do.	0·57	12·12	108
Steatite do.	0·48	13·23	117
do. and gauze	„	13·04	115
do. 15 holes	0·44	13·56	120
do. and gauze	„	13·35	118
do. 15 holes	0·43	13·00	115
do. and gauze	„	13·56	120
do. 15 holes	0·42	12·50	110
do. and gauze	„	13·09	116
Porcelain (Bengel), 30 holes	0·35	15·33	135

All the 15-hole burners had a 7-inch chimney, and the gas was burnt at the parliamentary rate of 5 cubic feet per hour; but the 30-hole burner (Bengel) had an 8-inch chimney, and the gas was burnt at the rate of a little less than 4 feet per hour, and the illuminating power was then calculated to 5 feet. It is evident, therefore, that if a fixed quantity of gas, say 5 feet an hour, is to be passed through the burner, the burner must be selected to give the maximum amount of light, and therefore no fixed measurement of burner can be specified; but if, on the other hand, the burner is a fixed instrument, then the quantity of gas passing it in a given time must be left open, and the supply must be regulated to the best effect. This, I believe, is the proper and the fairest means of estimating the illuminating power of gas. It would then be said that with a certain specified burner, as, for example, the Bengel, a certain amount of light was given with not more than a certain quantity of gas. This is the method employed in France. In Erdmann's gas-prover, however, the condition of things is reversed, as we are here estimating the quantity of air necessary to destroy the light by burning the solid carbonaceous particles, and therefore we should experiment on the gas burning at a given rate—say 0·84 cubic foot per hour. The instrument thus gives reliable indications of the quality of the gas, as may be seen from this diagram, which is taken from the experiments of Mr. William King, of Liverpool.

Illuminating Power of Gas when burned at a given Rate in Erdmann's Gas Prover—viz. at Rate 0·84 *Cubic Foot per Hour.*

	Description of Gas. Newcastle Coal.	Equal Parts Newcastle and Wigan.	Wigan Coal.	Boghead Coal.
Height of flame (inch)	1·87	2·00	2·75	5·50
No. of index of prover	14·72	23·39	32·78	61·14
Relative values of do.	1·00	1·59	2·22	4·15
Coefficient of power	0·70	0·70	0·72	0·70
Illuminating power (co-efficient=0·7)	10·30	16·37	22·95	42·80
Do. do. by photometer	10·30	16·35	23·58	42·96
Relative values	1·00	1·58	2·29	4·17

The general laws which have been deduced from these facts are—1. That with all burners the maximum amount of light, in the case of common gas, is always secured by burning the gas at a pressure of from 0·08 to 0·12 of an inch of water at the orifices of ignition. 2. That with Argand burners of 15 holes the best size is the 0·06 of an inch for each hole, and with 30 holes, the measurement should be the 0·024 of an inch; and with fish-tails or union burners, the holes should be the 0·06 of an inch, and the slit of the bat's-wing the 0·03 of an inch wide. 3. That the consumption of gas should be regulated in the Argand to a little below the top of the chimney, and in the fish-tail and bat's-wing it should not range beyond from 3½ to 4½ feet per hour. 4. As the measurement of the burner has much to do with the supply of air to the gas, the external diameter of an Argand burner with 15 holes and a 7-inch chimney should be 1·1 inch, and the internal diameter 0·44 inch; while in the 30-hole burner and 8-inch chimney (Bengel), the external diameter should be 0·89 of an inch, and internal diameter 0·35 of an inch; and the diameter of the nipple of the fish-tail or bat's-wing should range from 0·22 of an inch to 0·35.

These are the leading facts to be kept in view; and now, in conclusion, I have to say that there yet remain many important points for consideration, not only as regards the combustion of gas for economic purposes, but also as regards the chemistry of the waste products, as they are called, in the manufacture of gas; and these I hope to have an opportunity of elucidating.

Dr. Letheby was ably assisted in his lecture by Mr. Sugg, who provided all the instruments and burners used during the lecture.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF JUNE, 1865:—

Maximum light estimated by sperm candles according to the Act	14·7
Minimum light—sperm candles	12·4
Average light—sperm candles	13·7
Traces of ammonia, indicated by turmeric test-paper	Constantly.
Traces of sulphuretted hydrogen, indicated by lead test-paper	None.

THE COAL MINES OF THE WORLD.—M. A. Burat, in a work entitled "Situation de l'Industrie Houillère en 1864," gives the following as the statistics of the extent of known coal-fields, and their annual production:—

	Extent in Hectares (1 Hectare being equal to 2·471 Acres).	Tons.
British Isles	1,570,000	86,000,000
France	350,000	10,000,000
Belgium	150,000	10,000,000
Prussia and Saxony	300,000	12,000,000
Austria and Bohemia	120,000	2,500,000
Spain	150,000	400,000
North America	30,000,000	20,000,000
	32,640,000	140,900,000

As regards France, the coal basin of the Loire, which is only 25,000 hectares in extent, furnishes three-tenths of the whole of the coal raised in the country.

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.			Glasgow.			Newcastle			Wales.			Yorkshire, Derbyshire, and Staffordshire.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Pig Iron, No. 1, G.M.B.	3	17	6	2	15	3	2	12	6	3	5	0	3	10	0
1¼ and 2-inch Socket-pipes	7	10	0	6	0	0	6	15	0	6	15	0	7	10	0
2½ and 3-inch ditto	7	0	0	6	0	0	6	5	0	6	10	0	7	0	0
4 and 5-inch ditto	6	10	0	5	10	0	5	15	0	5	0	0	6	10	0
6 inches and upwards ditto	6	5	0	5	0	0	5	10	0	5	15	0	6	5	0
Retorts, 1st fusion, hot blast	6	0	0	—			5	5	0	5	10	0	6	0	0
Ditto, 2nd ditto, cold ditto	7	0	0	5	15	0	5	15	0	6	0	0	7	0	0
Tank-plates, ¼ thick and above	6	10	0	5	10	0	5	10	0	5	15	0	6	5	0

WROUGHT IRON TUBING,

Subject to 50 *per cent. Discount.*

	2 in.		1½ in.		1¼ in.		1 in.		¾ in.		½ in.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1	8	1	0	0	10	0	7	0	5	0	4½
Ditto ditto, from 6 inches to 18 inches—each	3	0	2	0	1	9	1	3	1	0	0	9
Connecting-pieces, or Long Screws	3	6	2	3	2	0	1	6	1	2	0	11
Bends, Springs, and Elbows (wrought iron)	3	9	2	3	1	9	1	0	0	10	0	8
Tees, wrought or cast	4	0	3	6	2	9	1	6	1	1	0	10
Crosses, ditto	4	6	3	0	2	6	2	0	1	6	1	2
Iron Cocks	17	6	9	6	7	6	4	6	3	3	2	6
Ditto, with brass plug	28	0	16	0	13	0	7	9	5	6	4	6
Diminishing Sockets, Caps, Plugs, and Nipples	1	3	0	9	0	8	0	6	0	5	0	4
Plain Sockets	1	0	0	8	0	7	0	5	0	4	0	3
Syphons, 2-quart	15	0	14	0	13	6	12	0	12	0	—	

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s.6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	5s.9d
Cork	9s. 6d. to 9 6
Dover, Folkestone, and Ramsgate	6 3
Dublin	9s. 6d. to 10 0
Exeter Quay	8 6
Ipswich	5 6
London (from Leith)	8 6
London (Pool)	6 0
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7 3
Plymouth	8 6
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel:—

Barcelona	£25 10s
Bordeaux	£14 to 15 0
Boulogne and Calais	7 0
Cadiz	17 0
Copenhagen	£8. 10s. to 9 0
Genoa	£23. 10s. to 23 15
Hamburg	£8 to 10 0
Havre de Grace	£9 to 9 5
Leghorn	23 10
Lisbon	£15. 10s. to 16 0
Rotterdam	£7. 5s. to 7 10
Stettin	10 10
Trieste	22 0
Venice	25 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000,	£2. 10s. to £2 15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 0
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p. ft. run,	5s. 6d. to 0 7 0
Tough Cake Copper, p. ton	87 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (in London), p. ton	8 0 0
Foreign Spelter, p. ton	22 0 0
English Block Tin, p. ton	97 0 0
Banca, p. ton	95 0 0
Tarred Rope Yarn, p. cwt.	1 6 0

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	5 0 0	5 10 0
10000	5	Do., second issue	3 0 0	5 0 0	3 to 3½
10000	5	Do., third issue .	1 0 0	5 0 0	1¼ to 1⅜
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29½ to 30
8200	20	Do., new . . . (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holyweil.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	79½ to 79¾
6000	50	Do.	30 0 0	10 0 0	49¾ to 50¾
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30⅛ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7⅛ to 7⅜
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L) Colonial & General	5 0 0		3 to 4
17490	25	*Commercial* . . .	25 0 0	10 0 0	43 to 43½
3334	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	20 5 0
17500	20	Do.	10 0 0	8 0 0	10 5 0
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 17⅝
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 12¾
4000	50	*Equitable*	50 0 0	10 0 0	83 0 0
4000	25	Do., new shares.	21 0 0	10 0 0	
23406	10	European (Lim.) .	10 0 0	10 0 0	14 0 0
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	7 to 7⅛
20000	10	*Great Central Gas Consumers* . . .	10 0 0	10 0 0	16¾ to 17
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	85⅛ to 86¼
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	91¼ to 92¼
3000	40	*Independent* . . .	40 0 0	10 0 0	66 0 0
3000	10	Do.	10 0 0	5 0 0	8 10 0
3000	20	Do.	7 0 0	7 10 0	9 0 0
6886	50	*London*	50 0 0	10 0 0	80 to 80½
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sk		6 0 0	
11828		Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	6 0 0	
150000	1	Oriental, Calcutta	1 0 0	8 0 0	1¼ to 1⅜
10000	5	Ottoman (Limited)	5 0 0		3⅜ to 4¼
10000	10	Pará (Limited) . .	10 0 0	5 0 0	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 0 0
3600	100	Do., new . . .	10 0 0	7 10 0	14 to 15
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
		Rio de Janeiro (L).			
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	16 0 0
10000	10	Do., new	4 0 0	10 0 0	7⅛ to 7⅜
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35½ to 36
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16½ to 16¾
10000	10	Do., B shares.	5 0 0	10 0 0	8¼ to 8⅜
		Do., C shares.	2 0 0	10 0 0	4 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 17 6
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

"George Glover and Co., per centage of error on the number tested, 2·116.
Thomas Glover " " " 2·812.
Croll, Rait, and Co. " " " 5·540.
Thomas Fletcher " " " 15·121.
Joseph Boulton " " " 25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

Established 1830.

JOHN BENT AND SON,
BELL BARN ROAD, BIRMINGHAM,

Manufacturers of the IMPROVED TWO-DIAPHRAGM DRY GAS-METER, with ROTATING VALVE, which entirely overcomes the objections so frequently raised against the usual kind of Slide-Valves, of tilting, &c., and allowing gas to pass unregistered. Particular attention is paid to the Diaphragms, and also to the mixture of the metals of which the Valve and Valve-Cover are composed, so that the meter works with less friction than any other.

A considerable number have been in use a sufficient length of time to prove them, and are giving every satisfaction.

Also, Manufacturers of COMPENSATING and ORDINARY WET METERS, in strong TIN-PLATE Cases, or EXTRA STRONG WROUGHT IRON These latter are lighter in weight than the usual Cast-Iron Case Meters, while they have the advantage of being so much stronger, and not liable to breakage from any cause. These Cases can be applied to meters in use at present, as they can be made to suit any size drums, and at a moderate cost.

All Meters stamped, unless ordered to the contrary.

Manufacturers of STATION-METERS, TEST GASHOLDERS, and STREET-LAMPS and REGULATORS.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

This Paint having been in general use over four years (especially in some of the principal Gas-Works) and proved itself the best light-coloured paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (28s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

GAS.

WANTED, a Man practically acquainted with the manufacture of gas in clay retorts, and the distribution, in a provincial district; and who has knowledge of fittings. He will not be required to keep books, except time-sheets.

A cottage, gas, and coals, on the premises.

Applications (stating age, where employed, reference, and salary required) to be made, by letter only, to GAS, Perrens and Harissons, Clay-Works, STOURBRIDGE.

SUPERINTENDENT OF GAS-FITTERS.

WANTED, by the Wolverhampton Gas Company, a SUPERINTENDENT of GAS-FITTERS. He must be competent to measure work, draw out estimates, and, with an assistant, keep the stock and books of that department; as well as have a general knowledge of the routine of a Gas-Work.

Applications to be made by letter, addressed to the Chairman of the Board of Directors.

JOHN ANNAN, Engineer.

LURGAN GASLIGHT WORKS.

WANTED, on the 1st of August next, a MANAGER. He will be required to make out the index of the meters quarterly, superintend the setting and working of clay retorts, and keep a close and constant supervision over the works.

A liberal salary will be given, and there is a good residence and garden attached to the works.

Candidates will be required to be in attendance at the Board on Monday, the 3rd of July next, at three o'clock P.M.

Applications, enclosing testimonials, to be lodged with the Secretary up to the 1st of July.

Security will be required.

By order,
WM. BAIRD, Secretary.

Lurgan, June 5, 1865.

BODMIN GAS CONSUMERS COMPANY, LIMITED.

WANTED, at Midsummer next, a Person thoroughly competent to undertake the general management of gas-works capable of supplying a town containing upwards of 4000 inhabitants. References as to character and ability indispensable.

Applications, stating salary required, to be sent to me, at my offices, Market Street, Bodmin.

PRESTON J. WALLIS, Secretary of the Company.

Bodmin, May 31, 1865.

NIGHT FOREMAN OF RETORT-HOUSE AND WORKS.

WANTED, a steady, active, sober, middle-aged Man as a NIGHT FOREMAN over Stokers, and to attend to the pressure and Works generally at night time. Must read and write. Wages 28s. per week.

Applications to be sent in to "SOUTH WALES," care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

LAMP-POSTS, BRACKETS, and LANTERNS, in great variety, from the cheapest to most expensive class, both for ordinary street lighting, railway-stations, and public entrances.

For designs and prices, please address in full, WILLIAM HOOD, 201, Upper Thames Street, LONDON.

WANTED, Nos. 296, 299, and 300, of the JOURNAL OF GAS LIGHTING. Full price will be given by the advertiser for a copy of each of the above numbers, clean and perfect.

Address same to Mr. KING, 11, Bolt Court, Fleet Street, LONDON, E.C.

EIGHTH THOUSAND.

AGRICULTURAL VALUE OF REFUSE GAS LIME.

By PROFESSOR VOELCKER,
Professor of Chemistry to the Royal Agricultural Society of England.

Price 10s. per 100, or by post, 10s. 6d.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

THE Imperial Gaslight and Coke Company hereby GIVE NOTICE that the Price for Gas supplied by this Company per meter will be REDUCED from 4s. 6d. to 4s. per 1000 cubic feet on and after the 1st of July next.

By order of the Directors.
HARRY CHUBB, Secretary.

Office, 33, John Street, Bedford Row, June 16, 1865.

WANTED immediately, by a Man 30 years of age, a Situation to TAKE CHARGE of a small GAS-WORK, or as WORKING FOREMAN. Can lay mains and services, knows both clay and iron retorts; has been all his life in the trade; and can have a 4½ years character from the situation he is leaving.

Address, A. LANE, Gas-Works, PONDERS END, N.

A Gentleman, 26 years of age, thoroughly conversant with accounts, desires an appointment as SECRETARY to a GAS COMPANY, or as CORRESPONDENT and CONFIDENTIAL ASSISTANT to a GAS ENGINEER and CONTRACTOR. Unexceptionable references, and security if required.

Address, G. A. S., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Gasholder-Tank (new or second hand), not exceeding 27 ft. in diameter. Also two PURIFIERS, with wrought-iron covers, 5 by 4 and 3 deep.

Address, Secretary of the Bognor Gaslight and Coke Company, Limited, Bognor, SUSSEX.

TOWYN GAS-WORKS.

THE Directors of the Towyn Gaslight and Coke Company, Limited, invite TENDERS for the Erection of their WORKS.

Plans and specifications may be seen, and further information may be had, at the Secretary's Office, on and after Monday, July 10, 1865.

Copies of plans and specifications may be had on application to the Superintendent of Works, on payment of 10s. 6d.

Tenders to be delivered on or before Monday, July 17, 1865, at three p.m.; and the Directors do not bind themselves to accept the lowest or any tender.

Towyn, Merionethshire, June 19, 1865.

GAS COALS.

WANTED, 200 Tons of Pelaw Main COALS, to be delivered at the Works of the Bognor Gaslight and Coke Company, Limited, in the first week in August.

Tenders for the above to be sent in to the Company's Secretary, Bognor, SUSSEX, by the 21st of July, endorsed "Tender for Coals."

The Directors do not bind themselves to accept the lowest or any tender.

MAIDSTONE GAS COMPANY.

TO COAL MERCHANTS AND OTHERS.

PERSONS are requested to send to Messrs. BEALE and HOAR, MAIDSTONE, on or before July 12, 1865, TENDERS for Supplying this Company with good GAS COALS, naming the coal as follows:—

August, 1865.	1000 tons
Sept. „	1000 „
October „	1000 „
Nov. „	1000 „
Dec. „	800 „
March, 1866	1200 „
	6000 tons

Tender 1.—To deliver the coals free into the measures of the Company alongside their wharf at their Works in Maidstone, at per ton.

Tender 2.—To deliver the coals into barges at Rochester, free on board, at per ton.

Payment by cash on delivery.

The Company do not pledge themselves to accept the lowest or any other tender.

BEALE and HOAR,
Clerks to the Company.

Maidstone, June 23, 1865.

CHATTERIS GAS AND COKE COMPANY, LIMITED.

THE Directors of the above Company are prepared to receive TENDERS for the Supply of 250 Tons of unscreened GAS COAL. To be delivered at Chatteris Station in quantities of 50 tons per month, to commence in September next. The coals to be dry, and of a good quality, and free from dirt, slag, or other admixture.

The Directors do not bind themselves to accept the lowest or any tender.

Tenders to be addressed, A. SWABY, Manager, Gas-Works, Chatteris, CAMBRIDGESHIRE.

GAS COAL.

MESSRS. RICHARD EVANS & CO., Haydock Collieries, near St. Helen's, are prepared to SUPPLY their best GAS COAL to Gas Companies on favourable terms.

This Coal is extensively used by some of the largest Gas Companies in the Kingdom.

It produces 9,400 cubic feet of 17-candle power, and yields 13 cwt. of coke per ton.

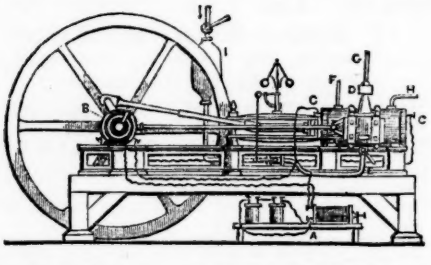
IRON GAS-MAINS and Gun-Metal STEAM-COCKS, the best and cheapest in the trade, at J. HAWKINS, Hill Top, WEST BROMWICH.

Samples and price lists sent on application.

LENOIR'S PATENT GAS-ENGINE.

PUBLIC

EXHIBITION,



From 11 to 1,

AND

3 to 5 Daily.

40, CRANBOURNE STREET, LEICESTER SQUARE, LONDON

Manager and Secretary (pro tem.) MR. C. W. WOOD.

MANUFACTURERS, READING IRON-WORKS COMPANY (late BARRETT, EXALL, and ANDREWES).

Consumption of Gas not more than 70 feet per horse-power per hour of ACTUAL *work.*

The Gas-Engine is elegant in appearance, in construction simple; there is no boiler, generator, or accumulation of power, so that there is no danger. It is very clean and free from heat, smoke, dust, dirt, or noise. Its power is either constant or intermittent, and its cost only co-existent with its working. No skilled engineer is required. It can be instantly started, and as quickly stopped. Being light in weight, it can be worked in any apartment, or on any floor, and where steam-power would be totally inadmissible. With the leading Fire Insurance Companies it does not entail any charge for extra risk. The price of the Engines, including the necessary apparatus, is as under—½ horse-power, £65; 1 horse-power, £85; 2 horse-power, £110; 3 horse-power, £135. The usual terms to the Trade, &c.

CONTENTS.

Notes upon Passing Events:— PAGE
The Coming Elections 529
Injunction against the Leamington Local Board for Polluting a Water-Course 529
The Utilization of Sewage Act 530
Occurrence of London Clay below the Chalk in a Well at Bocking . 530
Phillippe Girard, the French Flax-Spinner 530
Circular to Gas Companies:—
The Meeting of Gas Consumers at Guildhall 532
The Phœnix Gas Company *v.* Dethick 533
Responsibilities of Gas Companies for Damages caused by Escapes of Gas 533
A Gas Consumer's Complaint against the Phœnix Gas Company . 534
The Position of the Canterbury Gas Company 534
Correspondence:—
On Gasholders and their Connecting-Pipes 534
Register of New Patents:—
Applications for Letters Patent. 534
Grants of Provisional Protection 534
Notices to Proceed 535
Patents which have become Void 535
Parliamentary Intelligence:—
Progress of Bills in House of Lords. 535
Progress of Bills in House of Commons 535
Legal Intelligence:—
Court of Appeal in Chancery—Simpson *v.* the South Staffordshire Water-Works Company 535
Court of Exchequer—The Phœnix Gas Company *v.* Dethick . . . 536
Miscellaneous News:—
Metropolis Gas Supply—Meeting of Gas Consumers at Guildhall . . 544
Meeting of the Malta and Mediterranean Gas Company. 546
Lighting Bombay with Gas 547
The South Staffordshire Coal-Field. 547
Share List of Provincial Gas Companies 548
Share List of Metropolitan Gas Companies 552
Price Current 552

ERRATUM.

In the foot-note, page 513, first column, line 3 from bottom, *for* "workings," *read* "washings."

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, July 25, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JULY 11, 1865.

Notes upon Passing Events.

BEFORE the next series of these "Notes" appears, the election contests will have ended, and a very large number of gentlemen sent on their parliamentary travels to realize their hustings promises. Most prominent, wherever loud voices are required to conciliate large constituencies, have been those cheap Johns of politics, whose chief stock in trade lies in flattering the many-headed and hard-handed multitude. "The dignity of labour" is the favourite text and the favourite cant with such gentlemen; if you were to believe them, they would sooner be journeymen tailors or shoemakers than sell the shoes and trousers others have made. Mr. Carlyle is supposed the great chief of these praisers of journeymen work. A celebrated passage, beginning "Two men I honour and no third," is often quoted in support of the theory that the man who works with his hands is a more respectable member of society than the foreman who looks after him, the clerk of the works who supervises the foreman, or the master who finds money and enterprise for the work, say, of building, or the architect who prepares the plan. Whether this is what Mr. Carlyle means it is impossible to say; he writes an *argot* of his own invention, which may mean anything or nothing, just as his admirers please. This question may be left to the *Saturday Review* (anti-Carlyle) and the *Reader* (pro-Carlyle) to settle; but in the meantime we venture to assert that to set up mere handwork as entitled to special respect is sheer cant. Unquestionably it is more respectable and more honourable to work than to beg or borrow money—more healthy than to live a life of real idleness and thoughtlessness on the fruits of some predecessor's industry. But to take a familiar, homely illustration, we should like to have an opportunity of asking the hustings orator who has been dilating on "the dignity of labour the source of all wealth," whether a gas-fitter who has saved money, and with the small virtues of civility and punctuality has made a connexion and retired from journeyman work, is a less dignified character than the men whom he employs. The orator knows he is not; his praise of labour is a mere device for flattering those who work either because they cannot find any better way of living, or because they prefer the certain enjoyments of wages weekly spent to the privations of frugality. From time to time some eloquent advocate of the rights and wrongs of the labouring classes rises from the ranks and becomes conspicuous by his spoken and written eloquence or business talents; but it is a significant fact that these successful ones do not practise what they preach. They take the earliest opportunity, like sensible men, of leaving the needle, the awl, or the chisel, in favour of the editorship of a paper, secretaryship to a friendly society, or the more profitable, if less dignified, position of landlord of a public-house. A good mechanic is undoubtedly a more respectable person than the most ingenious beggar; but it is quite as often indolence—mental indolence—that makes a man work all his life with his hands instead of so working with his head as to set his hands at leisure.

One of the last acts of the dying Parliament was to pass an Act continuing the present powers of the Poor Law Board. But in the discussion in the House of Commons, when Mr. Villiers was more than usually foolish and insolent, it became plain that the large powers of the board will not be continued many years. The system under which quires of paper are covered to settle whether a pauper boy shall have a new pair of breeches before taking his way into the outside world, while paupers like Richard Gibson are left to fester to death, cannot be sound. Some supervision guardians require, but on somewhat broader principles than those practised by the legitimate pupils of Mr. Edwin Chadwick. In the matter of public works the late Parliament will take a high rank, next, perhaps, after the Parliament that gave this country its network of railways. Lord Stanley, an important political person, has declared himself against the principle of patents for inventions. Lord Stanley is a book-learned man, full of all the knowledge that the study of books can teach; but he has never mixed with men of the world, and, with the best intentions, can have no sympathy with the man who has to fight the world to obtain a hearing. The present laws of patents of inventions may be as full of abuses as the laws of real property, although that is saying a great deal; but it will be long before these abuses lead Parliament to decide that ingenuity of invention shall be unrewarded, unless the possessor is also a capitalist. In Bedfordshire the elections, which always bring out the hidden wrongs of silly farmers, have made public the fact that in that county there are landlords who forbid their tenants to use the reaping-machine, because it cuts the straw too short and fills the farmers stack-yards at the expense of the landlords game—driven by machinery from their accustomed covert. Is Lord Stanley prepared to legislate for machinery and against game? No! He will not—and he is wise and right—touch the rights of property to cure a temporary folly.

The question of the pollution of the water-courses of our country does not appear to gain much in certainty in the hands of Vice-Chancellor Wood. We noticed in our last number that he seemed to hold that towns, or Local Boards, were entitled to throw their refuse into the natural water-courses of their valleys, provided that they did not increase

the extent of the nuisance thus created or maintained; in fact, that the town authorities were entitled to the easement into the water-courses for the amount of the existing use so made of them. Now, the learned judge alluded to has decided that the Legislature has established a distinction between the streams that are navigable and those that are not, and that under these circumstances his court has power to interfere with the execution of the works that are intended to convert the water-courses that would have a feeble volume of water into the receptacles for house sewage. Upon this principle he has granted what is tantamount to an injunction to the Leamington Board of Health, calling upon them to prove that they will not in any way increase the pollution of the stream that would convey the house refuse of that town. In the case of small streams the Vice-Chancellor considers that the authorities have a duty to perform which they have not in the case of a large navigable river, and that the jurisdiction of his court extends to the one, but does not include the other of these natural drainage-areas.

This is, it must be confessed, a mere shadowy distinction, that the Vice-Chancellor has drawn between the two sorts of water-courses. We happen to know of such streams as are rendered navigable a little below the outfall of the sewage, which is effected in the part of the water-course that would have been rendered navigable had the old systems of locomotion remained in fashion, and which are of the same volume as the part of the river that is thus excluded from protection. These outfalls would, consequently, come under the Vice-Chancellor's category of those with which his court could not interfere, and the proprietors of the land and of the water privileges would be left to their remedy at law for the repression of any nuisance that might be thus created; yet the injury to everybody concerned would be as great as though the outfall were placed within the part of the river that is beyond the navigation. Thus, at Bury St. Edmunds, the outfall of the sewage is placed just above the commencement of the barge river, and below the point where the river Lark receives the waters from the Mermaid's Pits, that contribute to it a perennial supply, which alone renders the river fit for navigation. According to the Vice-Chancellor's decision, the proprietors below the outfall would only have the right to proceed against the town authorities in case of an increase of the nuisance arising from the town drainage; yet if the outfall had been executed in the part of the course of the river Lark that is sensibly above the navigation, they would have been entitled to stop the proceedings of the town by injunction. It is the attempt by the Vice-Chancellor to establish a difference between the two kinds of outfalls that brings so much uncertainty into this question; and we would add that it seems particularly absurd, as the volume of waters flowing down a mountain stream may be, and often are, much more important than those which are retained by locks for navigation purposes in the low lands. The Vice-Chancellor, however, feels his court to be entitled to interfere with the discharge of the sewage into the first category, or one similar to it; he does not think that it extends so far as to allow him to interfere with the operations of the sewage authorities in the second, though the nuisance be ever so great, until the rights of the several parties to the suit shall have been ascertained at law. One hears of "the glorious uncertainty "of the law;" but really the state of this branch of it, is not creditable to those who are entrusted with its administration.

The Government have apparently thought that the time had arrived when they might interfere in the matter of the discharge of town drainage, or sewage; and they have passed an Act "for facilitating the more useful application of sewage "in Great Britain and Ireland." Yet this measure is as pale and characterless a piece of legislation as it is possible to conceive, and it must be considered to leave the question just where it was, as it confers no rights—it imposes no duties—on the sewage authority than are at present entrusted with that branch of the public service. The Act provides only that the sewer authority should have power to enter upon certain property to carry out the works that they may deem necessary; it provides also that two or more sewer authorities may combine for the purpose of executing works for the collection and disposal of sewage; and it goes on to define what branches of local taxation shall be specially liable for the outlay that may be incurred in carrying out the objects of the Act. But this does not in any way deal with the apathy that so strongly marks the proceedings of all the sewers authorities in this matter; it leaves them free to cast their foul matters into the water-courses of their valleys, provided they construct them so as no sewer shall "drain *direct* into any stream or water-"course," as the writers of this Act, with a charming ignorance of the English language, express their meaning. The great difficulty, however, in all the cases that have yet come before the public is to get the local authorities to undertake the necessary expense, so that a merely permissive Bill will only prove a dead letter. What is wanted in this case is some measure that shall compel the bodies having the control of the public funds to exert themselves in order to obviate the inconvenience that may arise from the concentration of the sewage. If all that has been said of late of the value of sewage irrigation be at all founded on fact (and, be it observed, we entirely concur in all that has been said by the Royal Commission that was appointed to inquire into the application of sewage to land)—if all this be correct, there can be no harm in making it compulsory to employ the sewage in this manner. The Government is in this matter, in fact, like the poor cat in the adage, it lets "I dare not" wait upon "I would;" and, as a necessary consequence, it impresses upon the measure that it introduces for the encouragement of sewage applications a character of weakness and imbecility.

To pass from the consideration of the shortcomings of our law makers, and of our law distributors, to the consideration of the eternal laws of nature, we may mention one fact, which lately occurred in sinking a well through the London clay, at Messrs. Courtauld's factory, at Bocking, near Braintree, in Essex, as being calculated to throw some light upon the configuration of our country in the period immediately antecedent to man's appearance on the face of the globe. In this case, the well was begun with the conviction that the superficial strata would be passed through, and that the London clay would be met with beneath the gravel and sands, to the total depth of about 200 feet from the surface; where it was calculated that the basement beds would be succeeded by the chalk. At about 28 feet from the surface, the well-borer, Mr. Docwra, of Islington, came upon what appeared to him to be the main body of the chalk, and he continued boring in this to the depth of 42 feet from the datum line, when his men found that they were again in the London clay. It would thus seem that the appearance of the chalk in this case was in some way or other connected with the occurrence of large boulders, or masses of that formation, which had previously been noticed at Cromer, in Norfolk. These boulders must have been carried by some glacial action, and they may be considered to be connected with the appearances that have been noticed in the brickfields at Erith, that were described by Mr. Burnell, in a lecture read before the Foremen and Clerks of the Works Society. However, the interest of the occurrence is in the enormous size that the boulders, in the case of Cromer and Bocking, had attained, and in the transporting power of the current, or the glacial action, that they were subjected to; the lesson to be learned from their interference with the regular nature of the strata, is that the well-borer should never be content with the indications that he may meet with, at what would be thought sufficient depths to justify the conclusion that he had arrived at the truth of the formation of the district that he was employed upon. This at least appears to be proved—viz., that the surface of the country must have been subject to many changes within a comparatively recent geological epoch.

We often repeat, after Sterne, when vexed by some shortcoming of the let-alone system of legislation, "They manage "these things better in France;" and, whether it be true or not, it does us good to be discontented, and to ask the reason why this or that grievance should exist. We have nothing to boast of in the matter of our treatment of great inventors in the good old times. Crompton lived to show how slight are the rewards of an ingenious mechanic unprotected by a patent law. The Corts made untellable millions for England, and as a reward were tortured all their remaining lives by the endless vexations which the law, in the ages of the greatest lawyers, liberally applied to all claimants not backed by the largest capital. It is a vulgar error amongst the admirers of Cæsarism, that under an enlightened despot, men who deserve well of their country and do not meddle in the talk of politics are sure to be appreciated and rewarded. We recommend to those with such opinions a study of the "Life of Philippe de Girard," by Benjamin Rampol, lately published in Paris. Philippe Girard appears to have been born a gentleman of fine fortune, and a mechanic, to whom invention was a necessity. The

author claims for him—on what grounds does not appear—several improvements in the steam-engine which are ordinarily attributed to Americans and Englishmen; but his reputation rests on his machinery for superseding hand labour in flax-spinning. One of Napoleon's favourite ideas during his attempted conquest of all Europe, including England, was to make France independent of British commerce for either manufactured or raw produce. The biographer observes, "To dis-"pense with the produce of England was half way towards "conquering her. None of Napoleon's lieutenants made a "more effective campaign against England than Richard Lenoir, "who established cotton factories on the English system in "France, and even in Paris." Considering the ill fortune of Napoleon's lieutenants in combats with the English, this is not saying much. However, Napoleon saw plainly that cotton factories without cotton, which British cruisers excluded, were of little practical value, and expected an enormous assistance in carrying out his Continental system if machine weaving could be adopted to flax and hemp. With this view, on the 12th of May, 1810, the Emperor issued a decree, in which he offered £40,000 as a reward for the invention of a linen combing and weaving machine. The *Moniteur* containing this decree reached the Girard family while engaged on their morning meal. "Philippe," said his aged father, "this is your busi-"ness." Philippe read the paper himself, and shortly afterwards retired to his room with a handful of flax, and locked himself in. He did not reappear until the next morning, and then, we are told, he had already solved the problem and settled the principle of the machine that was destined to revolutionize the linen trade. He ran to his father, embraced him, and cried aloud, "The million is ours." Up to that time his ingenuity had brought nothing but loss upon his family. The ancient patrimony of the Girards, which had been much diminished by the Revolution, was further embarrassed by his attempted improvements of the steam-engine and other inventions. The reimposition of the duty on salt had ruined some salt-works in which he had invested a considerable capital, and the introduction of the natural soda of Spain had closed a manufactory of artificial soda which Philippe had established near Paris. The solution of the problem proposed by the Emperor seemed destined to repay him for all his previous disappointments. Philippe repeated before his family the experiments he had already made in his own study, observing: "What I do "with my fingers my machine shall do, and then the invention "is complete." On the 12th of June, 1810, just a month after the appearance of the decree in the *Moniteur*, Philippe Girard made an application to the Minister of the Interior for a patent of invention, with a memorial describing the two fundamental principles of his proposed machine; which, it is enough to say here, are the principles on which the present system of linen manufacture is still worked. The application was referred to the consulting "Bureau" of Arts of Manufactures, and on their favourable report a preliminary patent, dated July 18, 1818, was granted to Frédéric and Philippe Girard. Unfortunately, the officers of State with whom Girard had to deal seem to have been both narrow-minded and greedy. They doubted the value of an invention which was so rapidly produced; thus the fertility of Philippe Girard's genius was positively injurious to his fortunes. In November, 1810, a ministerial decree adjourned the examination of plans and the award of prizes for three years, and settled that the prize was only to be awarded on condition that the fabric should be of a degree of fineness not required in commerce, and sold at a very cheap rate. Finally, the promised reward was to be reduced by half or three-quarters, unless all the conditions of the new programme were fulfilled.

In the meantime, Philippe Girard worked away at his invention, and produced a small machine with a dozen spindles. One of his friends and admirers (Chaptal) proposed to reward him in a manner eminently characteristic of French ideas; not by subscribing capital to enable him to work out his linen spinning machinery, but by creating for him the post of "Minister of Inventions," as if inventions could be grown like root crops. In his difficulties, Girard addressed a letter to the Emperor, couched in the language which Frenchmen and Italians seem to admire, but which to our colder ears sounds painfully inflated, bombastic, and almost ridiculous; and yet the writer was a man of genius, and deserved a better patron than the first captain of the age. In this letter, he says that "the thin "threads he presents shall, in the hands of his Majesty, "be strong enough to break the cables of his enemies." But the Emperor was too busy warring in Spain and preparing to march into Russia to listen to the petition of a mere inventor. A French reviewer mournfully exclaims that Girard's mechanical victory over flax might have done more than the victories of Friedland and Wagram "to chain continental Europe to the "fortunes of France, and crush the obstinate resistance of "Britain." Those who are fond of tracing the interference of Providence in small affairs might here perhaps remark, that the invention which was intended to be the ruin of England proved in the sequel one more addition to her sources of wealth, and the power so long used to preserve the peace of Europe. Girard determined not to wait for the expiration of the term of three years. He constructed not only, as required by the ministerial programme of November, 1810, "a machine of full "size, ready to work in a factory," but he set it to work, and manufactured linen on a great scale. One factory, with two thousand spindles, was established in Rue Meslay, and another in Rue de Charonne. In order to raise the necessary means, the brothers mortgaged their landed estates, which were in 1811 worth nearly £30,000. In 1812 Chaptal presented to the Emperor specimens of Girard's thread and linen, with the view of advancing the time for awarding the promised million francs. But the reverses of 1813 fully occupied Napoleon's attention. As a poet would say, Napoleon was too much occupied in weaving the winding-sheet of his own glory to think of such common things as ordinary shirts and shifts, and table-cloths. While working for the million of francs that never came, Girard tried to raise an income by selling his goods. The first sold well, but soon the general distress of the country stopped all business. With enormous expenses, and many thousand pounds worth of goods unsaleable, bankruptcy was approaching with rapid strides. On the invasion of France in 1813 he invented a steam-gun, thus preceding the now forgotten Perkins. The fall of the Empire completed the ruin of the Girards, and in answer to a request for time Philippe was threatened by his creditors with personal arrest. To add to his miseries, he was for a time robbed of the barren honour of his invention. "Two foremen whom he had trained—Lanthois and Cachard "—fled to England with tracings of his drawings and copies "of the specification of his patent, which they offered for sale "as their own, and found a purchaser at £25,000 in Mr. "Henry Hall." Hall, on the 16th of May, 1815, took out an English patent, which is only a translation of the French one; and the honest Cachard—"honest Iago"—found profitable employment in the linen factory of the Marshalls, of Leeds.

In the meantime the true inventor's position was growing worse every day. The looms of his great factory remained unworked; his debts accumulated by interest and law expenses. Under these circumstances, he very unwillingly, at the request of his creditors, entered into an agreement with the Austrian Government to establish machine spinning in that empire. But, in spite of the heavy pressure upon him, he reserved within his breast one part of his invention, with the hope of setting it to work in France at some future and happier period. He passed nine years in Austria, where he was well treated. A factory for the construction of his machinery was established on the Imperial domain of Hirtenberg. In the course of a few years his system was adopted in the linen manufactories of Bohemia, Moravia, Silesia, and Saxony. The central establishment prospered as long as it was confined to manufacturing and selling machines, but ceased to be remunerative when a spinning establishment was added. Girard invented a method for working up the waste flax, improved the water-wheels, and worked at improving the steam-engine. While his flax machinery, highly appreciated in Austria, enriched those who used it, official scientific authorities in France reported on it as "mechanically bad and practically useless." "It "injured the quality of the flax, could never vie in quality "with hand-work, and was finally objected to as likely to ruin "the trade of the spinning women!" This ignorant and malicious verdict killed Frédéric Girard, and reduced the whole family to despair. The spinning operations at Hirtenberg, undertaken contrary to the advice of Girard, ruined the once flourishing establishment.

In 1826, Philippe Girard, being then over fifty years of age, accepted from the Russian Government the appointment of engineer-in-chief of the Polish mines. He was compelled to accept this office in order to preserve a remnant of his paternal estate—consisting of a house for his family and the ruins of the old mansion—from his creditors. In order to carry out the wishes of the Russian Government,

he revisited England to study our mining system, to engage foremen miners, and purchase machinery. It was then that for the first time he discovered the extent to which he had been defrauded by Lanthois and Cachard. He visited Leeds, and saw the vast establishments of Messrs. Marshall and Messrs. Ives and Atkinson, and he wrote to a friend—"I "have seen the patents, and with grief found exact copies of "my own drawings." But even at that date the English flax-spinners had totally neglected the second part of his system, which consisted in deglutinizing the elementary fibres of the flax by pressure between cylinders. One, Mr. Key, an English mechanic, about the time of Girard's visit, had found this method in Girard's original patent, and took out a new patent for it on his own account. He would speedily have made a fortune had not the original inventor been on the spot, and ready to direct the attention of Key's competitors to the true source of his improvement. The strange thing is, that Girard seems to have derived no profit from his advantageous position. We are afraid that he was a thoroughly impracticable man, or perhaps, as his biographer suggests, he still cherished a wish to reserve his best ideas for his native country. It seems from his correspondence that he proposed to go from England to France, but was prevented by information that his creditors intended to arrest him on his way. He remained in Russia until 1844, and during that time benefited his employers with numerous mechanical inventions of value. He also founded a great flax-spinning factory, which gave rise to a village called after him, Girardow. For this manufactory he invented a second machine for combing flax, which is universally used at the present day. But while he was doing so much for his employers he was never able to accumulate any fortune himself. In 1833, the competition of the English linen manufacturers was so active that the French hand-made goods were almost driven out of the market. It never occurred to the French Government to avail themselves of the services of their countryman, the originator of the great improvement in flax-spinning. They could think of nothing better than to employ agents to copy and smuggle over English machinery, the exportation of machinery being at that time unlawful. Newspapers, and even deputies in speeches in the Chamber, were not ashamed to boast of the manner in which the system of spinning flax by machinery had been "secretly smuggled "away" from England.

Philippe Girard addressed from Warsaw a memorial to the King of France, claiming his share of the English improvements. This memorial would have been forgotten, had it not been for the Exhibition of Arts and Manufactures in Paris, in 1844, when, in consequence of a warm appeal from Arago, he returned to his native country, after an exile of 29 years. He was received with acclamation. He exhibited models of many of his improvements in lamps, in agricultural implements, in the manufactures of sugar, of muskets, and steam-engines, as well as flax machines. For these he received a gold medal, and at the same time his models were seized under an execution for one of his old debts, and he was obliged to hide himself in the country until the 1st of February, 1849, when his age, 69, privileged him from personal arrest! All attempts to obtain the promised prize of a million francs failed. "Monsieur Cunin-Gridaine, the Minister of Commerce," according to the French biographer, "would never admit "Girard's claims as an original inventor, because that would "have diminished his own merit as a smuggler of the English "machinery." Louis Philippe appears to have supported Girard's claims, but on the 26th of August this unfortunate genius died, a few hours after writing the last lines of a last appeal to the Government. It seems that his sympathizing countrymen embraced him, crowned him, medalled him, serenaded him, but did not subscribe for him. For his family nothing was done until 1853, when they obtained an annuity of £480 as a national reward, Thus Philippe Girard, born rich, lived in exile, and died poor and in debt, because he had invented a means of creating incalculable wealth.

We must not boast. In the old days before newspapers spoke daily, we too have treated inventors ill enough; but it is not too much to say that the "cold, egotistical, aristocratic islanders" could not have treated a great mechanic worse than the French treated Philippe Girard. Unfortunate gentleman! —for he was a gentleman—he should have been a brave, hard-headed, hard-hearted drummer boy, and then he might have died a marshal of France. We do not treat our soldiers so well in England, but we treat our mechanics better.

Circular to Gas Companies.

A MEETING, called by the Lord Mayor, on the requisition of a large number of gas consumers of the City of London of the highest respectability, was held in the Council Chamber of Guildhall on the 3rd inst., on the subject of gas supply. It will be seen, however, from the report of the proceedings inserted elsewhere, that very few of the numerous requisitionists attended, and that, instead of its being a demonstration of the citizens, it was converted by the members of the "London Gas Consumers Association," who had hired Mr. Flintoff for the purpose, into a means of attack on all the gas companies of the metropolis. The whole affair was a manœuvre and a mistake. The Lord Mayor signed the order convening the meeting on the 19th of June, four days previous to the meeting of the Court of Common Council, at which a resolution was passed sanctioning the application by the Corporation to Parliament for power to purchase the works and mains of the existing companies, or to construct gas-works of their own for the supply of gas. So far, therefore, as the City was concerned, all that the requisitionists could require had been agreed to, and the order for calling the meeting should have been annulled; but as the Lord Mayor had granted the use of the Guildhall for the purpose of holding a meeting, it was too good an opportunity to be lost by the persons calling themselves the Gas Consumers Association, and by dexterous manipulation they issued placards to which were appended the signatures of the original requisitionists, so as to make it appear that the meeting was one of the ratepayers and gas consumers of the metropolis in general, and not confined to the citizens. The Lord Mayor was thus made the cat's-paw of the gas agitators of the London parishes. He evidently felt the awkwardness of his position, and vacated the chair as soon as he decently could, leaving it to be filled by the chairman of the Gas Committee of the Common Council.

Mr. Flintoff's paid-for harangue followed the Lord Mayor's preliminary speech. It was of the usual character and vehemence, with a few new illustrations adapted to the novel circumstances of speaking in the Guildhall in the presence of the Lord Mayor and citizens of London. The meeting were told of the great services he had rendered to gas consumers in various towns in the kingdom, and that he had effected reductions in the price of gas equal to an annual saving of £60,000. He made the Great Central Company the especial butt for his assaults, and then, by reference to the prices charged in various towns, he contended that the gas consumers of London, who ought to be supplied at a cheaper rate than those in any other town, are charged the highest price for the worst gas. He repeated the assertion that gas-making is a very simple process, easily applied, and said that if the citizens manufactured their own gas, as was done by the local authorities in Manchester and other towns, they would save half the present cost. He called on them not to rely on Dr. Letheby's reports of the quality of the gas with which they were supplied, for the testing was a complete farce, unless it was carried on from hour to hour during the night as well as the day. All these points he enforced with thundering blows on the table that often overpowered the sound of his own voice, and his employers had no reason to complain of want of bold assertion nor deficiency of noise in his address.. Mr. Tripp, the secretary of the "Asso-"ciation," then moved a resolution to the effect that the manufacture of gas ought to be placed in the hands of the local authorities, and that it ought to be supplied to the public at cost price. The resolution was seconded by a gentleman, not a liveryman, and the conduct of the meeting seemed to be in a fair way of being taken out of the hands of the citizens altogether, when Mr. Dresser Rogers, who has been very active in the Common Council respecting the gas supply of the City, pointed out the anomalous position, and regretted that the numerous requisitionists should have kept away, and allowed themselves to be represented by a paid lecturer. There was a good deal of confusion in arranging what was to be done—whether the proceedings were to be limited to the consideration of the gas supply of the City, or whether the gas grievances of the whole metropolis should be included. The latter course was adopted; but as the Court of Common Council had previously determined the course which the Corporation should take, and there seemed nothing more to be said or done by them, the anomaly of holding a meeting in Guildhall to consider matters with which the citizens of London were not connected was attempted to be removed by making it appear that

its object was to support the Corporation in their application to Parliament. Some members of deputations who attended from various parishes then detailed grievances of which they complained, and the Western Company especially came in for a large share of abuse. Two of the allegations that seemed to tell most on the meeting were, that the gas companies made their customers pay for damages occasioned by the negligence of their servants, instead of bearing the loss themselves; and that one company exacted deposits before supplying gas, for which no interest was paid, and that thus their business was carried on with the money of their customers. It would have been well if some persons connected with the gas companies had been present to answer the assertions, for on those points we admit our inability to offer any satisfactory explanation. There was much uncertainty in putting the resolutions to the meeting, one of which, though declared to have been carried, was said not to have been formally put from the chair. As an example of the hurried and reckless manner in which the business was conducted, a resolution was carried with great cheering to the effect that steps should be taken to obtain a repeal of the Metropolis Gas Act of 1860, without proposing anything as a substitute. The folly of such a proceeding was pointed out by the *Morning Post*, in commenting on the meeting. Though the Metropolis Gas Act has failed to answer the expectations of those by whom it was promoted, there can be no doubt that it affords protection against abuse by the gas companies of the powers it conferred, and if the Act were repealed the companies would be left in full possession of those powers without any control. With regard to the resolution of the meeting to support the Corporation of London in their determination to apply to Parliament for power to manufacture and supply gas, we think they will require some more substantial aid to carry such a measure than that of a meeting at which a paid agitator was the principal speaker, and which proposed as a remedy for alleged abuses the abandonment of the protection that had been provided against them; nor is Parliament likely to grant the power sought for without compelling the Corporation to purchase the works and mains of the companies that now supply the City. The case of Manchester, which was adduced as showing the advantage of having gas supplied by local authorities, does not apply to the present condition of the City of London. At Manchester the local authorities obtained possession of the gas-works from the original company for a small sum, and for a series of years the gas consumers of the town were heavily taxed to provide the means for carrying on the works, so as to leave a surplus to be appropriated to the reduction of the rates. The gas consumers of Manchester were for a long time charged by the Corporation one-third more for the same quality of gas than was charged by the gas company of Liverpool, until their endurance became exhausted, and they would bear such exaction no longer. The Corporation of Manchester thus came into easy possession of their works, and they are now able to carry them on without the incumbrance of a heavy charge for interest on capital. It would be otherwise with the Corporation of London, were they to make a similar attempt to manufacture and supply gas. The interest of the money required to purchase the works of the existing companies would press severely on the gas account; and it is very doubtful whether—even under the best management of the proposed Corporation gas establishment—the citizens would find themselves in so good a position as at present, especially if they were to put in operation the protecting provisions of the Metropolis Gas Act. Another town, not far from Manchester, affords an illustration much nearer the case of the City of London. At Birkenhead the local authorities have become possessed of the gas-works by purchase from the former company at a fair valuation; and the result to the gas consumers is that they are now charged 5s. per 1000 feet for 16-candle gas while across the Mersey the Liverpool Company supply 20-candle gas for 3s. 2d.

The responsibility of gas companies for damages caused by escapes of gas has afforded, of late years, frequent occupation for our courts of law. The Wood Street fire actions are still fresh in the memories of most of our readers; and eight other similar actions were set down for trial during the present sittings at Guildhall, only one of which, however, has yet been heard, and the remainder will probably stand over until the sittings after the long vacation. In the action that has been tried, the Phœnix Gas Company were the plaintiffs against Mr. Dethick, a contractor working under contract for the Metropolitan Board of Works, for damage done to their pipes, causing an escape of gas, while making a sewer in a street at Greenwich; and another action is pending against the company for damage caused by an explosion of the gas that so escaped. In six other cases the Chartered Gas Company are the defendants for losses sustained by the fire at Saville House, Leicester Square; the aggregate amount of damages being laid at many thousand pounds.

The case of the Phœnix Company is a common one. The contractor had occasion to dig a trench 18 or 20 feet deep, parallel to a 2-inch branch from the gas-main. That branch was laid about 15 inches below the surface, and was stopped at the end of the street, but the excavation for the sewer curved round into a street at right angles with the one in which the gas-pipe was laid; the blank end of the pipe being just visible in the excavation. Two service-pipes branched from it within a few inches of each other, one to the right, the other to the left. The one branching to the right was tapped into the top of the gas-pipe and crossed the excavation; and that was the pipe to which the damage was done. The pipe branching to the left supplied the house in which the explosion of gas took place, but it had not been disturbed, and was perfectly sound. The right-hand service-pipe had been depressed where it crossed the excavation, and that depression had drawn it out of the gas-pipe, which was subsequently found to have been fractured at that place, though the witnesses disagreed on the point whether the fracture was recent or old; those for the plaintiff alleging that it was quite fresh, while those for the defendant alleged that it was old. The ultimate decision of the case depended apparently on the credit to be given to one set of witnesses or the other, and the number on each side was equal. It ought not, as the Lord Chief Baron observed, to have been very difficult for experienced persons to decide such a question, for it was a mere question of fact, independent of variations of scientific opinion; nevertheless, the witnesses on the opposite sides were directly at variance on the point. We fully agree with his lordship in his remarks on the subject. It is, indeed, humiliating to find persons arrayed against each other in such a manner, one swearing one thing, and the other the direct opposite; there being, so far as could be perceived, no sort of excuse for the difference that prevailed. There was other evidence, however, besides the appearance of the fracture, which showed that the escape of gas was owing to the negligence of the defendant's workmen. While the service-pipe that crossed the place where the excavation had been made was damaged, the other one, within a few inches from it, remained intact. What seems most conclusive as to the cause of the accident is, that no escape of gas had been noticed before the trench was dug, and the explosion occurred on the day or the day after the ground had been filled in. It appears to us, from a perusal of the evidence given, that the verdict ought to have been for the company instead of for the defendant, and that there has been in this, as in other cases, a failure of justice arising from the unpopularity of gas companies generally with metropolitan juries. For this unpopularity, we regret to say, the gas companies have in some instances given cause. In the *Times* a few days previous to the trial there was inserted the following letter complaining of the conduct of the Phœnix Company, and as the statements have not been contradicted, we assume they must be admitted to be correct:—

TO THE EDITOR OF THE "TIMES."

Sir,—The following will show the position the gas companies take up, and the inconsiderate manner in which they treat the public.

I occupy a private house on the Surrey side of London, a large district dependent entirely on the Phœnix Gas Company for its supply. Finding the application for Lady-day quarter was very much in excess of the corresponding quarter in previous years, I wrote to the company in the following very mild terms:—

"Referring to your application for £11. 11s. 4d. for gas for Lady-day quarter, there certainly must be some error in the amount charged. The corresponding quarter last year was £7. 3s. 6d., and the previous year £6. 17s. 3d. There is no reason for the increase, as, in consequence of the bad quality of the gas, we burnt sperm candles in our sitting-room, instead of a four-light chandelier, all this winter. I shall be glad if you will look into this matter, as I do not feel justified in paying such a large increase."

To this I received the following reply:—

"*Phœnix Gaslight and Coke Company, Incorporated 1824, Regulated 1847 and 1860.*

"Sir,—Your quarter's account for gas consumed was left on the card in your house at Lady-day last at 35,800 and 12,900 cubic feet, which, at 4s. 9d. per 1000 cubic feet, amounts to £11. 11s. 4d. As you decline to pay, I am directed to inform you that the supply will be discontinued, and the necessary measures will be taken to recover the rent due, together with the legal costs thereof, unless the amount be paid at this office within three days from this date.—I am, your most obedient servant,

"CHARLES PRIDDEN, Secretary to the Company.

"*Office*, 70, *Bankside, Southwark, June* 22."

I have lived in my present house about 13 years, and have always paid without the slightest demur every demand the company has made; and now that (though not refusing to pay) I merely ask them in the most gentle manner to look into that which appears to me an error, they reply in the threatening terms set forth. To me it is unimportant, but to a tradesman the fact of having his supply of gas cut off would be a matter of very serious inconvenience, and even of actual loss; to obviate which it would appear that he has no alternative but to submit to any demand the company might make upon him.

Knowing your love of justice and your aversion to all monopolies, I am induced to ask you to insert this.

I enclose my card, and you are at liberty to publish my name if you think fit. I am, Sir, your obedient servant, E. H. M.

Other instances have come to our knowledge of similar threats having been made in reply to similar complaints during the same quarter; but the gas consumers of the metropolis have the remedy in their own hands, if they will only put in operation the provisions of the Metropolis Gas Act instead of writing to the *Times*. It is compulsory on the companies to furnish a supply of gas to every householder within a certain distance from a main, on obtaining reasonable security for payment, if required; and if the company applied to wilfully fail to comply, they are liable to a penalty of £2 for every day, after the first seven, that the gas is not supplied. The attempt to coerce a customer into the payment of what he conceives to be an unjust demand by a threat to cut off his supply, is an arbitrary exercise of power which can be only justified when a fraud is suspected against which the law will not afford the company relief. Such conduct has done more to bring gas companies into discredit than either high charges or bad gas; and in urging the discontinuance of the practice, wherever it obtains, we promote the interests of the companies themselves.

The Canterbury Gas Company offers an instance how a once prosperous company may be brought to the verge of ruin. Notices of the proceedings in that city, commencing with a visit from Mr. Flintoff, and ending with the complete submission of the old company, and the reduction of the price of gas from 5s. 6d. to 4s. per 1000 feet, have from time to time appeared in our columns. The company were authorized by their Acts of 1822 and 1844 to raise £22,500 for the establishment of gas and water works. That capital was raised and expended in the early days of the company's existence, and for many years past the cost of every extension of the works has been paid for out of profits, which has necessarily enhanced the price of gas. Not only has the price been high, but the supply has been deficient, and the quality of the gas often so excessively impure as to instantaneously blacken test-paper. In addition to these delinquencies the old plan of cutting off the gas from complaining consumers was practised, and among others the head post-office of the city was placed in darkness, in consequence of the gas being cut off for non-payment of a disputed account. At length the limits of forbearance were reached and a new company was formed. The existing company then became alarmed, and negotiations ensued which ended in an arrangement that promised at one period to be satisfactory to the public. But the fatality which seems of late years to have attended all the operations of the company still adheres to them, and their first step has been to give a *carte blanche* to a firm of engineer-contractors to remodel their works, and it is, we are informed, almost worth paying a visit to Canterbury to see how lavishly such a commission is being executed. The incapacity of those who administer the company's affairs is still further exemplified by their having handed over the entire management of the works to contractors to manufacture and distribute the gas according to a plan similar to that practised in the adjacent borough of Dover. This is a breach of faith with the promoters of the new company which would justisfy its reconstruction, for it is quite clear that the contractors intend to get a profit from that arrangement, and such profit ought to be applied to the reduction of the price of gas to the consumers. It is well known that at Dover the company pay to their contractors from 6d. to 8d. per 1000 feet more for gas than they could manufacture it for themselves; but in that town the consumers, were they so inclined, might put in force the provisions of the Gas-Works Clauses Act, to ensure that the *joint* profits of the contractor and the company shall not exceed 7½ per cent., which is the average maximum dividend prescribed by the Dover Gas Company's Act. At Canterbury the company are not bound by the Gas-Works Clauses Act, and the consumers have, consequently, no redress except by promoting a competing company, which will retain the management in their own hands. In the face of misdeeds such as the existing company have committed, it is most probable that a new company would not have much difficulty in obtaining their Act, and in that case the ruin of the old company would be complete. Their condition should be a warning to all gas companies of what are the effects of mismanagement and want of conciliation, and shows the importance of being prepared to weather the storm whenever it may break over them.

Correspondence.

ON GASHOLDERS AND THEIR CONNECTING-PIPES.

Sir,—I am induced by Mr. Cathels' communication to the British Association of Gas Managers on this subject—reported in the Journal of the 27th ult.—to refer, through your columns, to the following practical proof which occurred under my own observation of the important necessity of the "time-honoured custom" of providing "the conventional inlet and outlet" pipes to gasholders.

About ten or twelve years ago a new holder was erected at Uttoxeter (Staffordshire), of which gas-works I was then manager. Both the inlet and outlet pipes were connected to one syphon-box, enclosed in a dry well. The holder in question performed its duties perfectly satisfactorily until a charge of 5 retorts was put on about eight p. m., when, lo and behold! a scene of indescribable consternation ensued. The entire lights in the town became eclipsed, or "small by degrees and beautifully less," gradually reappearing in the course of an hour or two, the vagaries being repeated for two or three nights in succession—or, as the townsfolk termed it, *the gas going to sleep*. With the other holder no such frolic was observable, the inlet and outlet of which had each a separate syphon, therefore evidently indicating the admission of atmospheric air, or an extraordinary excess of carbonic acid gas.

Upon examination we discovered that the double syphon-box was minus its centre partition, in consequence of which the gas from the purifiers passed direct into the mains without previously mixing in the holder. The convenience of the dry well rendered easy access to the syphon-box, which defect was remedied by inserting a wood partition. The cause was thereby removed, and the effect ceased.

The preceding facts are indisputable, and portray conclusively the absolute necessity of *both* the inlet and outlet pipe, and also, in certain cases, the utility of the dry well; otherwise, to adopt the theory of only *one* pipe into the holder, the consequences will be precisely similar to what I have stated. C.

Gas-Works, Reigate, Surrey,
July 3, 1865.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1687.—Henry Saxon Snell, of 36, Chancery Lane, London, and Frederick Edward Thomas, of 10, Manchester Terrace, Liverpool Road, Islington, for "*Improvements in apparatus used in supplying gas to burners.*" June 23, 1865.

1695.—Joseph Solomon, of Red Lion Square, London, optician, for "*Improvements in the preparation of magnesium for illuminating purposes.*" A communication. June 24, 1865.

1696.—Charles Ross Bamber, of Jersey, commander, Royal Navy, for "*A new or improved apparatus for producing the magnesium light.*" June 24, 1865.

1703.—Charles Worssam, engineer, of Commercial Wharf, Kingsland Road, and George Evans, gentleman, of Gloucester Place, Portman Square, London, for "*An improved pulping and compressing machine for the treatment of peat as a fuel, and gas for illuminating purposes.*" June 26, 1865.

1724.—Paul Jacoveno, retired Russian naval officer, of Bucharest (Wallachia), momentarily of 11 and 12, Panton Square, Coventry Street, London, for "*Improvements in decantations and raising petroleum and other oils, and in apparatus therein employed.*" June 28, 1865.

1732.—Georges Lizars, gas-meter manufacturer, of 36, Rue Lafayette, Paris, for "*Improvements in dry gas-meters.*" June 29, 1865.

1737.—William Schofield, of Heywood, Lancaster, manager of the Heywood Gas-Works, for "*Improvements in the manufacture of gas-retorts and other articles made of fire clay, and in furnaces for burning the same, and for other purposes.*" June 30, 1865.

1749.—James Atkins, of the firm of Robert Walter Winfield and Co., of Birmingham, merchants and manufacturers, for "*Improvements in the manufacture of certain kinds of metallic tubes and rods, and in ornamenting metallic tubes and rods.*" July 1, 1865.

1780.—Hermann Beigel, of Finsbury Square, London, for "*Improvements in the means of obtaining or producing oxygen applicable to various useful purposes.*" July 6, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1586.—John Edgar Poynter, of Glasgow, manufacturing chemist, for "*Improvements in purifying paraffin.*" June 12, 1865.

1591.—John Thomas, of Battersea, Surrey, iron-founder, for "*A new material to be used in the purification of heating and lighting gases.*" June 12, 1865.

1658.—John Scholl, of 41, Berwick Street, Soho, London, for "*Improvements in gas-burners.*" June 20, 1865.

1667.—Michael Henry, of 84, Fleet Street, London, for "*Improvements in apparatus for measuring fluids.*" A communication. June 21, 1865.

NOTICES TO PROCEED.

500.—James Nicholas, of Aspull, near Wigan, Lancaster, oil refiner, for "*Improvements in the process and apparatus for producing oil and coke from coal and slack.*" Feb. 22, 1865.

547.—Comyn Ching, of 23, Little St. Andrew Street, Upper St. Martin's Lane, London, gas engineer, for "*An improved fluid valve.*" Feb. 27, 1865.

568.—Thomas Slocombe Hall, of Truro, Cornwall, wine merchant, for "*Improvements in gas-burners.*" Feb. 28, 1865.

611.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in machinery for obtaining motive power from ammoniacal gas.*" A communication. March 4, 1865.

668.—George Frederick Ansell, of Bernard Street, Russell Square, London, analytical chemist, for "*An improved mode of, and apparatus for, ascertaining and indicating the presence of explosive gases.*" March 9, 1865.

727.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*Improvements in apparatus for distilling oils and other liquids from coal and other substances.*" A communication. March 15, 1865.

917.—James Rathgate, of Edinburgh, for "*Improvements in gas-meters, and in the machinery or apparatus connected therewith.*" March 31, 1865.

943.—Charles Denoon Young, of Perth, Scotland, mechanical engineer, for "*Improvements in double-acting lift and force pumps.*" April 4, 1865.

1393.—John Ambrose Coffey, of 17, Gracechurch Street, London, consulting engineer, for "*Improvements in distilling apparatus.*" May 20, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1842.—Joseph Walter Taylor, "*Improvements in valves, and in means for regulating and indicating the flow and pressure of fluids.*" June 20, 1862.

1834.—Stephen Holman, "*Improvements in pumps and valves.*" June 21, 1862.

1905.—Joseph Wall, "*Improvements in taps for controlling the flow or passage of fluids.*" June 30, 1862.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, JUNE 26.

The Highbridge Markets and Gas Bill.—The Select Committee reported that they had not proceeded with the consideration of the Bill, the opposition thereto having been withdrawn.

The Tunbridge Wells Water Bill was reported without amendment.

The Oldham Borough Improvement Bill was reported specially, with amendments.

TUESDAY, JUNE 27.

The Belast Water Bill and the Southport Improvement Bill were returned from the Commons, with the amendments agreed to.

The Bromley Gas, and the Highbridge Markets and Gas Bills were reported, with amendments.

WEDNESDAY, JUNE 28.

The Oldham Borough Improvement Bill was read a third time, with the amendments, passed, and sent to the Commons.

THURSDAY, JUNE 29.

The following Bills received the Royal Assent:—The Merthyr Tydfil Local Board of Health; Neath Water; Southampton Gas; Manchester Corporation Water; West Bromwich Improvement: Cheltenham Water; Crays Gas; Southport Improvement; and Belfast Water.

The Dewsbury, Batley, and Heckmondwike Water Bill.—The Chairman of Committees informed the House that the promoters do not intend to proceed further with the Bill during the present session.

The Tunbridge Wells Water Bill was read a third time, and passed.

The Bromley Gas, and the Highbridge Markets and Gas Bills, were read a third time, with the amendments, passed, and sent to the Commons.

FRIDAY, JUNE 30.

The Newton Water Bill was read a third time, and passed.

The Port Glasgow Police and Water Bill and the Torquay Gas Bill were returned from the Commons, with the amendmends agreed to.

MONDAY, JULY 3.

The Bromley Gas; Highbridge Markets and Gas; and the Oldham Borough Improvement Bills, were returned from the Commons, with the amendments agreed to.

WEDNESDAY, JULY 5.

The following Bills received the Royal Assent:—The Tunbridge Wells Water; Newtown Water; Port Glasgow Police and Water; Torquay Gas; Bromley Gas; Highbridge Markets and Gas; and Oldham Borough Improvement.

HOUSE OF COMMONS.

TUESDAY, JUNE 27.

The Belfast Water and Southport Improvement Bills.—The Lords amendments were agreed to.

THURSDAY, JUNE 29.

The Torquay Gas Bill.—The Lords amendments were agreed to.

The Metropolis Gas Act (1860).—A petition of gas consumers, ratepayers, or inhabitants within the limits of the Metropolis Gas Act. 1860, for repeal or alteration of the Act, was presented, and ordered to lie on the table.

MONDAY, JULY 3.

The Bromley Gas; Highbridge Markets and Gas; and Oldham Borough Improvement Bills.—The Lords amendments were agreed to.

Legal Intelligence.

COURT OF APPEAL IN CHANCERY.

APRIL 20, 21, AND MAY 5.

(*Before the* Lord Chancellor.)

SIMPSON *v.* THE SOUTH STAFFORDSHIRE WATER-WORKS COMPANY.

Mr. Greene, Q.C., and Mr. Haynes appeared on behalf of the plaintiffs; the Attorney-General, Mr. Malins, Q.C., and Mr. Speed for the company.

This was an appeal from a decree of Vice-Chancellor Stuart, dated the 19th of November last, whereby his honour refused a motion on the part of the plaintiffs to make perpetual an injunction which had been granted by Vice Chancellor Kindersley in the vacation, restraining the company from proceeding under their notice to treat, and their compulsory powers to take, the whole of a close of land through which they proposed to carry an aqueduct by way of tunnel. The particulars of the case, and the clause of the Water-Works Clauses Act, 1847 (10 and 11 Vic., c. 17), upon which the question was argued, will be found stated in his lordship's judgment below.

The Lord Chancellor said: In legislating for public undertakings, and conferring compulsory powers to take land, Parliament has at all times manifested the utmost anxiety to impose upon the company, or the undertakers, the obligation of giving to the landowner the most precise and definite information with regard to the quantity of land to be taken, or the manner in which the land is intended to be affected; and the enactments contained in the Acts of Parliament conferring the powers to carry an undertaking into effect will be generally found to embody, by reference, the plans and the notice given by the plans to the landowners of the intention of the company. Before adverting to the particular facts of this case, in illustration of the truth of that observation, I would remark that I entirely concur in the rule laid down by Lord Cottenham at an early time of the administration of justice with regard to these railway works, and other works of a similar description, that it was incumbent upon the company to prove clearly and distinctly, from the Act of Parliament, the existence of the power which they claimed a right to exercise; and if there was any doubt with regard to the extent of the power claimed by them, that doubt undoubtedly should be for the benefit of the landowner, and should not be solved in a manner to give to the company any power that was not most clearly and expressly defined in the Statute. I would also further remark, with reference to a point that was much dwelt upon in the argument—namely, the effect of the incorporation of the general Act into the special Act, that the general Act must be looked at with reference to the powers conferred upon companies of dealing with the land when acquired, but that it is to the special Act that you must especially have regard for the purpose of ascertaining what I may call the contract between the landowner and the company, and the power which the company has conferred upon it of taking the land of the landowner. Now, with these general observations, I come first to consider what it is which, in the plans and sections deposited by this company with the clerk of the peace, is indicated by those plans as the manner in which the company intend to deal with the land, and the extent of the landowner's interest which was intended to be taken by the company. Now, upon that point I entirely concur in the representation of the effect of the plans which is contained in one or two passages of the affidavit of Mr. Hawksley. Mr. Hawksley says, in the 7th paragraph of his affidavit, and very correctly: "When it is intended to obtain the authority of Parliament to the sinking of wells and shafts for obtaining subterranean water, it is the common and general practice to indicate on the deposited plans and sections the situation of such wells and shafts, and to give notice to the owners and occupiers of the lands in which they are intended to be situated, of such intention." He then goes on to say that he has examined the plans deposited by the defendants for the purposes of the Act of 1864, and that he does not find any well or shaft indicated thereon. He then further observes that in the case of tunnels and other subterranean works it is the common practice of water companies not to take the entirety of the piece of land, or the surface of the land, but merely to acquire the right of carrying the tunnel through the land for the purposes of the works. He then goes on to state in his affidavit that the deposited plans indicate, with reference to the land of the present plaintiffs, that the entirety of the contemplated works of the company would consist of a tunnel, to be driven at a certain depth, with a limited power of vertical deviation, and that the operations of the company, as indicated by their deposited plans, are limited to that work, and extend to nothing more. I have examined the plans and sections, and I think the representations contained in those parts of the affidavit to which I have referred are a very correct conclusion of the fact, which is indicated upon the face of the plans, as to the extent to which the company intended to deal with the lands of the plaintiff. Now, that being the effect of the deposited plans, we next come to consider the language of the special Act; for undoubtedly, although it is not the rule of Parliament, it would be competent to the Legislature to confer a greater right than that which is indicated by the plans. The material section to which the argument was almost entirely directed (with the exception of one or two clauses in the general Act of Parliament, the Act of 1847), the section in the Act of 1864 which contains the special definition of the power of the company with reference to the land of the plaintiff, is the 5th section; and I must call attention to it at some length. It first of all refers to the plans and sections deposited as showing the situation, lines, and levels of the intended aqueduct, and the lands required for the purposes thereof. The preamble and narrative of the section, therefore, refers you to the plans for the purpose of ascertaining the land that was required. It then confers upon the company a special power, and the power is "to make and maintain the reservoirs, aqueducts, and other works hereinafter described in the line and situation, and on the levels and upon the lands delineated on the plans and defined in the sections;" and then there is a power to take, purchase, and use such of the lands mentioned in the plans as the company may deem necessary "for all or any of those purposes." The power given to the company is to do the defined work "upon" the described land, and the power further is to take the land or so much of it as shall be necessary for that work. Now a great deal of argument turned upon the use and meaning of the word "necessary," and it was attempted on the part of the company to contend that the word "necessary" extended

so far as this, that they might take so much of the land as they should deem necessary, not for the particular work indicated, but for any collateral purpose connected with that work. I am by no means of opinion that such an extended construction can be given to the word. I entirely concur in the conclusion (which, indeed, is rendered imperative by the decision of the House of Lords) that it would be entirely within the power and judgment of the company to determine for themselves the magnitude and extent of the particular work defined; as, for example—that work being a tunnel—that the tunnel should have a diameter of six feet, or ten feet, or twenty feet; but the word cannot be used for the purpose of extending the authority given to the company, so as to enable them to add upon the land other works in addition to the works defined, and thereby to augment their power of taking the land of the landowner beyond that which was indicated in the plan, and, being indicated in the plan, is embodied and transferred by reference into this section of the Act of Parliament. Now the power which is given to the company is to make "the reservoirs and aqueducts, and other works hereinafter described." The section of the Act to which those words of reference relate is the 7th section, and the 7th section, so far as it is applicable to the land of the plaintiff, contains these words: "That it shall be lawful for the company to execute all or any of the following works, shown on the said plans, as the company shall from time to time deem expedient, that is to say;" then passing over a paragraph which is inapplicable and only relates to something else, the paragraph which is applicable is in these words: "An aqueduct constructed, in tunnel or otherwise, as shown on the original plans;" then the *terminus a quo* and the *terminus ad quem* of the aqueduct is defined in the section, and applying that to the plans, we find that the aqueduct here referred to and there described, where it passes through the land of the plaintiff, passes through it in tunnel only, and is limited entirely to the tunnel at a certain depth passing through those lands. So far, therefore, as this 5th section and the relative 7th section are concerned, there is a definite authority conferred upon the company to make the work indicated in the plan and further described as an aqueduct, consisting of a tunnel, with this licence only, that they may make that work as they shall deem it necessary, which, of course, must be limited to the work itself, and cannot be extended to give them power to superadd to those works other works of which there is no indication and no description at all. Then a good deal of argument was used on the part of the company with a view to show that there were other words in the 5th section which contained, by a species of implication, the right to extend the works beyond what was indicated in the plan. It would be very difficult to find any words admitting of such a construction, when they are in immediate connexion with words which give the company that precise and definite authority which I have already explained. But the words that were relied on by the company for this purpose are the concluding words of the 5th section, by which the company is empowered to take such water as it may require for the purposes "of the Acts of 1853 and 1857, and this Act and the incorporated Acts." The argument was of the ordinary kind—namely, that inasmuch as this was a general power to take such water from the lands as the purposes of these Acts required, it contained, by necessary implication, the right to do everything that should be essential or necessary for the purpose of taking the water. I cannot arrive at any such construction, for the effect of it would be to supersede, and, in truth, to annul all the directions that are previously contained, and convert the whole section into a general authority to the company to take all the water they could in any manner acquire throughout the whole course of the lands indicated, and to do whatever they might deem necessary for the purpose of taking that water. The laborious care shown by Parliament in defining positively what they were to do, and in laying down the bounds on one side and on the other which they were not to transgress, would have been an idle superfluity if these latter words were capable of such an interpretation. It is quite clear that the words have only this meaning—that, whilst they are authorized to make the works, they shall have a right to take, as incident to those works and as consequential on those works, whatever streams of water the works, when constructed in the line indicated, might tap or bring into their tunnel, or whatever water might percolate and flow by the natural agency of the law of gravitation from any part of the circumjacent soil into the tunnel that was to be constructed. That is the natural meaning of the words, that interpretation renders them consistent with the rest of the section, and I must adhere to that, and not adopt a wide and extended meaning that would overrule and render in point of fact superfluous, as I have already observed, the rest of the enactment. The remaining arguments that were dwelt upon very much by the defendants were derived chiefly from the general Act of Parliament of 1847, and they were urged with a good deal of ingenuity. First of all, it was contended that, by the interpretation clause of the general Act of 1847, which is embodied in this Act of 1864, the word "water-works" was defined to mean "the water-works and the works connected therewith;" and, therefore, it was contended that, in authorizing the company to make a reservoir and to make an aqueduct and to make a tunnel, inasmuch as the reservoir and aqueduct and tunnel were water-works, the form of enactment carried with it the power to make other works connected therewith. Now, it would be a sufficient answer to that to say that the particular noun "water-works" is not to be found in the enactment of the 5th section. But, in addition, the whole argument fails, because the language of the interpretation clause is not merely that the word "water-works" shall mean "water-works and works connected therewith," but it is that it shall mean the "water-works by the special Act authorized to be constructed." We are again remitted, therefore, to the special Act for the purpose of ascertaining what is thereby authorized to be constructed; and the answer to that question I have already endeavoured to give out of that special Act. But this is not all, because the language of the 2nd section of the general Act (the interpretation clause being in the 3rd section) is definite, that the expression "the lands and streams" shall mean "the lands and streams of water which shall, by the special Act, be authorized to be taken and used;" and the whole tenor of this general Act of Parliament may be thus expressed—that it refers you by anticipation to the special Act for the purpose of ascertaining therein what is the land to be taken, and what are the works to be done upon the land. Referring you to that, it then invests the company with general powers which may be useful or necessary for the purpose of carrying into effect upon the land authorized to be taken the work which by the special Act is definitely described. But then there was another argument derived from this general Act of Parliament, and it was thus founded on the 12th section. The 12th section is a general enactment, beginning thus: "Subject to the provisions and restrictions in this and the special Act, and any Act incorporated therewith, the undertakers may execute any of the following works for constructing the water-works," and then a number of collateral works are specified; and the argument therefore was that, being empowered by the special Act to construct a tunnel, they are empowered by this section to add to the tunnel all these, or any of these auxiliary works. I cannot, however, put an interpretation upon the clause which will be utterly at variance with the restrictions that are carefully thrown around the powers of the company in the rest of the Act; and I must take it that this general clause was intended to be subjected to the same restrictions, because it begins "subject to the provisions and restrictions in this and the special Act," and I construe those words, therefore, as meaning "subject to the company having authority by the special Act to take the lands and to construct certain works;" and then, if they have power and space and room enough in the land that they are authorized to take to afford them an area for these additional works, they may be empowered to make these collateral and auxiliary works. For that purpose I am referred again to the Act, and I find authority to take the land for the purpose of constructing a tunnel, and that the power to interfere with the land and to hold it permanently, saving for the purpose of construction, is limited entirely to a tunnel of such width, diameter, shape, and construction as the company may deem necessary; but not with a particle of authority to superadd to that any additional work either underground or upon the surface of the land to be taken. Upon the whole examination of the matter, I think that the true interpretation of the Act of Parliament is brought back to that which is certainly consistent with the general intent and the anxious purpose of the Legislature, and also with what natural justice would dictate—namely, that the company shall not be permitted to commit a surprise upon the landowner, by telling him that he will be required to part with so much of his land only as is necessary for a particular and a definite and expressed purpose, and that he should afterwards be told, "Nay, but we shall now take the whole of your land, because we deem it right to superadd to what we have expressed something in addition, something in extension of our original plan, but which was not indicated upon the notice given to you, or upon the plans and sections which we were bound to deposit and did deposit, in order that you might know how your property would be affected by our undertaking." Having arrived at that conclusion, both upon an examination of the general Act of Parliament and of the special Act of Parliament, I have no difficulty in coming to the determination that the plaintiffs here are clearly entitled to the relief they seek, and that, save for the temporary purposes of construction, which will be of course of a limited duration in point of time, the company are not entitled to take and hold permanently any other portion of the plaintiffs land than so much as is necessary for the construction of, and will be contained within, such tunnel, in conformity with the plan deposited, as the company shall deem necessary for the purposes of their work authorized by the Act of Parliament. I mean to express the declaration in such a form as to limit the extent of ownership by the company; but at the same time to let that ownership extend to the measure in point of size, diameter, and shape of the tunnel, which the company shall deem necessary; but *ultra* that tunnel I mean to define that nothing can be required to be yielded up by the landowner to the company, or retained and taken permanently by the company.

His lordship added that the costs of the suit must be borne by the company.

COURT OF EXCHEQUER.

GUILDHALL, MONDAY, JULY 3.

(*Before the Lord Chief Baron* POLLOCK *and a Special Jury.*)

THE PHŒNIX GAS COMPANY *v.* DETHICK.

Mr. HUDDLESTON, Q.C., Mr. J. C. MATHEW, and Mr. BIRON, appeared for plaintiffs; and Mr. JAMES, Q.C., Mr. ARCHIBALD, Mr. HORNE PAYNE, and Mr. W. GRANTHAM for the defendant.

Mr. HUDDLESTON, in opening the case, said the plaintiffs were the Phœnix Gaslight and Coke Company, and the defendant was a contractor working under contract for the Metropolitan Board of Works. This action was brought against the defendant, nominally to recover damages for the careless working of his contract; he said nominally to recover damages, because the real question which would have to be decided in this cause, and, he was sorry to say, most likely in some 18 or 20 others, was who was responsible for the injury which undoubtedly accrued to a great many persons—viz., the plaintiffs, the Phœnix Gas Company, or Mr. Dethick, the contractor under the Metropolitan Board of Works. It appeared that in the month of February last, certain works in connection with the sewerage of the place were being done in a street at Greenwich, called Coltman Street, which street runs at right angles with another street, called Lower Thames Street. The sewer which was in course of construction was at a depth of something like 18 or 20 feet from the surface, and an excavation had been made for the purpose of the work of 3 feet or more in width. The defendant was the contractor for this work, which was pushed forward with considerable rapidity, and completed about the 14th of February. On the following day the ground was filled in, and about six o'clock in the evening of that day a violent explosion of gas took place, which created a great deal of injury to persons and property in the neighbourhood, and amongst other injuries a house, shown upon the model produced, which belonged to a person named Hemstead, was reduced to ruins. Inquiries were immediately instituted for the purpose of ascertaining the cause of the explosion. Persons connected with the gas company went to the spot, and the ground, which was very hard in consequence of a severe frost, was opened. It was obvious from their investigation that the foundation of this house had been erected upon the remains of some old pottery-works. They consisted of broken tiles and brick ends, which, not fitting closely together, offered a sort of porous receptacle for the gas that had escaped from the pipes, the hardness of the ground above causing the gas to be retained below the surface until it found its way through some orifices beneath the house, and then an explosion took place. The question, therefore, arose, how was it that the gas escaped. The main of the gas company went along this street, and a service-pipe was attached to it for the supply both of this and the adjoining house. [The learned counsel explained on the model the position of the pipes and the trench.] There was also a service-pipe which crossed the place where the sewer had been excavated and supplied a house on the opposite side. This service-pipe which so crossed the sewer came over the main, and was attached to it on the side nearest to Hemstead's house. There was, therefore, a sort of lever formed by it, and on digging down to the spot it was found that this pipe had become bent, and, by the pressure of the earth upon it, had been torn out from the main. Owing to this circumstance no doubt the gas had escaped, and finding its way through the loose bricks and tiles had reached the house, and thus caused the explosion. The question, then, was, how was this pipe displaced from the main?—a question upon which he should have to offer a great amount of practical and scientific evidence. He thought after hearing that evidence the jury would come to the conclusion that it must have been caused by some extrinsic force violently operating upon it, and not from the age or inherent weakness or deficiency of the pipe. The service-pipe itself was found to be bent, and the main was fractured or ruptured, showing clearly that some extraneous force had been applied to it. The inquiries which were insti-

tuted showed that the excavation underneath the pipe was continued to the extent of nearly 18 or 20 feet down, leaving a certain amount of superincumbent earth piled up above it. The contractor's men, after taking out the struts and timbers employed for supporting the sides of the excavation, had not sufficiently rammed down the earth under the pipe to protect and support it as they ought to have done. The consequence was that the weight of the superincumbent earth had pressed upon the service-pipe and drawn it out of the main. The appearance of the earth around the main also showed that the escape of gas had been only recent, the soil not being at all impregnated, as it would have been had the escape continued for any length of time. The plaintiffs—the Phœnix Gas Company—immediately after the explosion had applications made to them on all sides for compensation for the injuries which resulted. Several of the more urgent of these claims they had met, relying upon the same course being pursued in this case as in others, that where a contractor having a great deal of work in hand, had, through carelessness or negligence, caused an explosion of gas, he would make compensation to them for the loss occasioned by such carelessness or negligence, and would recoup them the gratuities which they had made to the sufferers. Mr. Dethick, however, declined to do so, and, under these circumstances, the company were compelled to bring their action. The question which the jury would have to consider when they had heard all the evidence, practical as well as scientific, was whether the tearing of the service-pipe from the main did or did not arise from the inefficient manner in which the work in connexion with the sewer had been executed. If it was so, the defendant would be liable. In reference to a remark which his lordship made at the opening of the pleadings, he would observe that the gentlemen who instructed him had not the slightest objection to have this matter inquired into by an engineer, or by some other competent person, provided the parties in the next case would become parties to the reference.

Lord Chief Baron POLLOCK said the question in this case was whether the defendant produced a state of things that ended in a rupture of the company's gas-pipe, and so let out the gas into the premises, and caused an explosion.

Mr. HUDDLESTON said that really was the simple question. The company which he had the honour to represent were quite prepared to make every compensation to the unfortunate sufferers, if it should be proved that the fault was theirs; but, inasmuch as they firmly believed—and they invited the decision of the jury upon this point—that the fault originated with the contractor, and that no escape of gas would have taken place if the earth had been properly filled in, they considered that the contractor was the person who ought to make compensation to the sufferers by the explosion.

Mr. JAMES said that question did not arise in the present case. The only question here was who did the damage to the pipe—nothing more.

Mr. HUDDLESTON: Whether it was occasioned by the negligence of the contractor?

Mr. JAMES: Yes.

Lord Chief Baron POLLOCK: Is there no consequential damage?

Mr. HUDDLESTON: No, my lord.

Mr. JAMES: Another question may arise—viz., whether this was done in the execution of works authorized by a statute which made provision for compensation in case of injury.

Lord Chief Baron POLLOCK: They say that they have been put to great expense in consequence of the damage.

Mr. HUDDLESTON: Only to the extent of a few pounds.

Lord Chief Baron POLLOCK: I suppose the company seek to recover in this action all their loss?

Mr. HUDDLESTON: They do not seek to recover any compensation already given to the persons injured, but simply the damage done to the pipes, and the question is whether that damage arose from the negligent working in connexion with the sewer or through a defect in the pipes themselves.

Mr. *David Hunter*, examined by Mr. MATHEW.

I am the superintendent of the Phœnix Gas-Works at Greenwich, and have been in the employment of the company upwards of 14 years. On the evening of the 15th of February last, I was called to Coltman Street in consequence of the explosion. That was as near as possible about 20 minutes past six. I went immediately to the spot, and found the house at the corner, occupied by a man named Hemstead, in ruins. The company's main ran down Coltman Street into Thames Street. A sewer had been very recently made down Coltman Street, and the ground had been filled in that day or the day before. When I got to the spot I perceived that a large escape of gas was going on, the cause of which I directed the workmen to ascertain. They stripped down upon the main 20 or 30 feet further up Coltman Street, and cut it asunder, inserting a flexible tube into the end in order to get light to work by. The escape of gas then ceased, as the lower part of the main became dead. I told the men who were at work to be as careful as possible that they did not injure anything when coming to the place where the main was fractured. They found that the fracture was at the spot where the service went into the main across the sewer for the supply of Mr. Payne's house on the opposite side. The service was inserted into the main by means of a bend upon the top. We found that that service had become detached, and forced nearly three-eighths of an inch from the main, which was no doubt caused by the weight of the earth. The main itself also was fractured at the same time. Several pieces were broken off from it. I examined the fractured pieces, and found that it was entirely a new fracture; there was not the slightest appearance of its being an old fracture.

By the COURT: The difference between a new and an old fracture would be quite manifest.

By Mr. MATHEW: The metal of the main was in a very good condition indeed, although it had been down a number of years. In fact, during the whole course of my experience I never found a main in a better condition. There was not in the ground the slightest sign of there having been an old escape of gas. I examined the service-pipe also, and found it was perfectly good, with no appearance of a flaw about it. It was bent in the first instance, but after removing the earth from it, it sprung up more or less There was not the slightest indication of an old escape of gas about it; the escape was entirely a fresh one. It would be perfectly easy to tell, from the condition of the soil, whether there had been an old escape of gas. I found the soil about the service-pipe had been recently put there; it was very loose also underneath it. The ground in which the main had been laid was composed of a stratum of about 8 or 9 inches of broken tiles. The general surface of the ground above the service-pipe was 15 inches, but the earth was piled up for at least 2 feet or 2½ feet above that. The stratum of broken tiles extended between the main and Hemstead's house, where the explosion took place, also underneath the foundations of the house, so that the gas as it escaped readily passed beneath. When I went there, there were men engaged shoring up the house under the instructions of Mr. Roberts, the owner of the property. The earth which had been put in the trench ought to have been properly rammed so as to afford support to the service-pipe. The damage may have been caused by a blow from a maul when taking out the timber from the sides of the trench, or it may have been from a plank. [The fractured main and the service-pipe were produced.]

Cross-examined by Mr. JAMES: I have no direct record to show how many years this main had been laid. It was one which originally belonged to the Deptford Gas Company, and our company became possessed of their works in 1844. I believe this main was laid in 1841; it could not have been before that. It had never been laid bare before during my time except at the extreme part where there is what we call a dead end. That is about 3 feet from this spot, and about three years ago I had occasion to remove a service which formerly supplied several lamps. Nothing further was done then except to block up the end. There is only one lamp in the whole street, and that is 50 yards from this spot. The supply of gas through the service-pipe to Mr. Payne's house had been discontinued for some time; I do not recollect exactly how long. I presume it was in 1847, but I cannot speak positively. From that time down to the period of the explosion that pipe had never been used. The distance from the edge of the sewer trench to the part of the main where the service-pipe was inserted is as near as possibly 14 inches. It it not 3 feet 2 inches. I measured it as near as we could get to it, but in consequence of the timbers being taken out we could not come within an inch or two. I am quite sure it cannot be more than 15 inches from the edge of the excavation to the place where the pipe was inserted. The trench was about 3 feet 4 inches wide. We stripped the main that very evening. The great object was to stop the escape and to give light to the district. Mr. Porter, the defendant's manager, and several of his workmen were present at the time. By the request of Mr. Porter we left off doing more that evening, as he wished to examine it as it was next day. I readily assented to his wish. I discovered the fracture in the main that evening. I do not know that I observed anything else particularly, except what I have stated. The service-pipe was bent where it crossed the sewer. I did not measure the extent of the bend, but it was sufficient to draw the pipe out of the main. I told Mr. Porter at the time that there could be no doubt it was in consequence of their operations. I do not remember mentioning the circumstance to him of the bend in the service-pipe. The service-pipe was not removed until the 4th of May, when it was tested in the presence of Mr. Porter and Mr. Poole one of the inspectors of the Metropolitan Board, and also of several workmen. It had been insinuated by Mr. Porter that the escape was from the service that went into Hemstead's house, and to satisfy him I made an appointment to meet there, and said I would send a man to take it up and test it in his presence. The bend in the other service-pipe was not alluded to on that occasion. I may have done so upon another occasion, but I do not remember. I was upon the spot when the earth was taken up from about the main. I would have had it taken up at the time, but in consequence of the hardness of the frost I delayed it. There had been an intense frost for some days, and the ground was extremely hard. I did not observe the men at work filling in the trench the day before. When I passed through the street on Tuesday, the 14th, they were at work putting in the sewer. We are in the habit of having the pipes examined and renewed from time to time. We have relaid almost all the pipes in Greenwich since we have been there. That has been for the purpose of enlarging their capacity, and not in consequence of any deterioration. Those we took up were as good as new. We have never had one instance of being obliged to relay a main which we took from the Deptford Company in consequence of the badness of the metal. Some have been worse than others—they were not all equally good. I saw the defendant's workmen two or three times every day in different parts where the sewer was being constructed. They were at work in Coltman Street something like a fortnight. I considered it my duty as the servant of the company to go there from time to time to observe what was going on. The service-pipe was laid on to the main after we took it from the Deptford Company in 1846, or 1847. I did not see it put in. A man named Bishop, who has since died, did it. Sometimes the workmen drill the hole for the purpose of inserting a service, and sometimes cut it with a chisel and rymer. Drilling does not always make the best job. In the case of a large main we generally drill it, but in a small main like this we can make quite as good a hole by cutting it. No doubt it requires greater care to cut and ryme it. Even in small mains we sometimes use a drill. I cannot say that by that means we usually secure a better joint. I could myself make as good work with a punch as with a drill. I cannot say that there are more frequently mistakes from the use of the punch than from the drill. I do not know whether this is a drilled or a punched hole. I do not see that any one can tell, because the screw is perfectly distinct. The service had been well fitted into the main, which is shown by the end of the bend. The screw is perfectly entire in the main, and also in the service. Except where the service was inserted, there is no appearance of any old fracture in the main. There was a piece of the main taken away by Mr. Porter. I had that piece in my hand in the first instance; I did not examine it minutely, but I could see from the place where it was broken from that it was a new fracture. [The piece referred to was handed up to his lordship; and the main having been handed up also, the piece was fitted in, and counsel on both sides, and some of the jury, examined it minutely.] The main is in exactly the same condition now that it was in on the 15th of February; nothing whatever has been done to it. When we dug down to the service-pipe it was not found firmly imbedded in the ground; it was in the loose earth over the sewer. I presume that part of it which was between the main and the trench was imbedded in the stratum of bricks and tiles. I did not observe anything which would indicate that it was not firmly imbedded. The service-pipe to Hemstead's house was inserted in the main in 1845. It was taken up on the 4th of May and tested. There was no looseness whatever in the joint there; it was perfectly gas-tight. Mr. Porter requested that some portion of it might be unscrewed. He did not say there was a looseness about it. He asked to have it unscrewed, but I said it would make it useless for the purpose of evidence as to its position in the ground. It has not been altered since.

Re-examined by Mr. HUDDLESTON: It was tested in the usual way at the works by passing gas through it at a pressure at least three times greater than it would ever pass through it in the street; and we found that it was perfectly sound. We had no opportunity of testing the main. We have never had any complaint as to an escape of gas at Hemstead's. We can readily tell whether an escape of gas in the ground has been recent or not, for if gas lies long in the ground it makes it black from the deposit of the carbon that is in the gas. There was not the slightest appearance of this kind here. I cannot say what is the duration of the life of a main; it depends very much upon the nature

of the soil in which it is laid. Those which we have taken up from time to time at Greenwich have been removed chiefly from want of capacity. We did of course come to some parts where they were deteriorted less or more, but there was nothing of the kind here. There is no carriage thoroughfare in Coltman Street; it has posts at the end to prevent the passage of vehicles. I have no doubt the cause of the injury to the main was the pressure of the superincumbent earth on the part of the service which crossed where the sewer had been excavated, or the use of the rammer when filling in the ground. A force applied to that portion of the service would be sufficient to affect the junction of the service with the main.

Mr. *William Innes*, examined by Mr. MATHEW.

I am the engineer of the Phœnix Company. I did not see the place where the explosion took place until the morning of the 16th February. I then particularly examined the main and the service-pipe I found that the pipes were lying in the trench together, and that the service-pipe was elastically sent out of the cast-iron main. The loose pieces of the cast-iron main were lying at the side of the trench. Except that portion of the main which had been screwed to the wrought-iron service-pipe, the fracture in the main was quite fresh. A considerable portion of the soil had been removed, but all bore evidence of having been placed there within a very few days. It was loose and what we should call tumbled in ground, and had been banked up above the level of the road to a considerable extent. It was at least two feet higher than the general level. There was nothing in the soil surrounding the service-pipe which bore any indication of an old escape of gas. As far as I could see the ground was untainted with gas. It would have been thoroughly apparent if there had been an old escape, both to the sight and the smell. I have examined the iron of the main; it is very good for a pipe of that description. We usually find such pipes a little more brittle than others. There is no appearance of an escape of gas from any part of it.

Cross-examined by Mr. ARCHIBALD: This is not the only explosion which has taken place in that neighbourhood recently. There was one in Union Street, not long before, from the pipes of our company. Union Street is about 400 yards, as the crow flies, from Coltman Street, but about half a mile by road. The escape of gas which caused that explosion could not be said to be from a pipe in connexion with this one, although the whole of the company's mains are practically one set of mains. There had been a recent opening in the ground at that place, but not for sewerage purposes. The cause of the accident was the service-pipe being drawn out of the main. My attention had only been called to the sewerage works in Coltman Street before the explosion from receiving the usual notices from the contractor that he was going to open certain streets. We gave instructions to our people to watch the progress of the works from time to time. I myself saw the trench while it was open, and observed that it was timbered. There had been a frost of four days duration just before, which had hardened the surface of the ground, but I do not think it would disturb the sewer works 20 feet below the surface. It would not stiffen the ground very much at that depth. The contractor's men would not be well able to proceed with brick-work, but it would not affect the filling in of the ground. I knew the exact position of our main, within a few feet, before the accident occurred. We have a map of all our mains. This main was laid by the Deptford Company in 1841. It was 1 foot 3 inches away from the cutting made for the sewer. I took the measure of the distance, and know that that is correct. The service-pipe which crossed the trench was about 3 feet apart from the service-pipe which entered Hemstead's house. I think that service-pipe, where it crossed the cutting, ought not to have been allowed to remain without support. We almost always do support them, even when crossing a trench only 3 feet 6 inches wide, to prevent the pipe becoming bent by being pressed upon by any weight above and water lodging there, which would stop the flow of gas. We are afraid of the deflection of the pipe by the weight by the earth over it. Its own rigidity would enable it to bear any reasonable suspension between the two supports of the side of the trench. It was quite safe to leave the pipe without support so long as the trench was open. If when the trench was filled in the ground was properly rammed down and made solid beneath the pipe, it would be as safe as it was originally. The mischief to be apprehended is from weight above it, the earth not being properly filled in and rammed down below. If it is properly secured below, it is of no consequence what you do above. I did not see the process of filling in this trench. I attribute the escape of gas to the fractured side of the cast-iron main, by the damage done to the service-pipe which crossed the trench—the other service-pipe remained intact; it is perfectly sound. The former was inserted into the main in this way: a hole was punched in the main, which was afterwards tapped with a steel tap, and a bend was inserted with a screw at the end of it, and made tolerably rigid. For small mains like this punching is the proper mode; in larger pipes the hole is drilled, as it is then the safer mode. You cannot with a 2-inch main drill with any security. The punching makes an irregular hole, and if you were to depend solely upon the punch, the service pipe would not be made to fit accurately, but in addition to that we use a rymer, which is a six-sided steel tool, that is worked round and round till it makes the hole cylindrical. We also use a tap by which a perfectly circular screw is formed. Drilling no doubt makes the best work, but a person accustomed to it and taking pains can make a perfectly sound job by using a half-round.

By the COURT: Drilling is not applicable to small pipes, because the circular form of the pipe prevents a perfect hole being formed. You only get a part-cut hole; but when you have a main so large that you have nearly a flat surface for the drill to act upon, you get a perfect hole.

By Mr. ARCHIBALD: I do not think a greater amount of leakage takes place with services that have been inserted by punching than with those that have been drilled—I believe there is no difference as far as leakage is concerned. The laying on of services is not done by piece-work; it is done by day-work, and the reason is, that all the gas that escapes is a loss to the company, who must therefore take care to make a good job. I saw the end of the service-pipe which supplied Hemstead's house after the explosion. I saw the elbow-joint which connected it with the house, but not till after it was taken out. I cannot of my own knowledge speak to its condition when in the ground. I did not see the operation of filling up the trench.

Re-examined by Mr. MATHEW: There was nothing to indicate that there had been any previous escape of gas from the main, or that the connexion with the service-pipe was not perfectly sound. It was evidently perfectly gas-tight throughout.

Mr. *James Hunter*, examined by Mr. MATHEW.

I am the son of Mr. David Hunter, and the deputy-superintendent of the Phœnix Gas-Works at Greenwich. I went with my father to the scene of the explosion, and at his request provided men to remove the soil, so as to ascertain the cause of the escape of gas. I examined the main and service-pipe, and as far as my experience enables me to judge, I believe the fracture to have been quite recent. There was nothing to indicate that there had been an old escape of gas at this place. The main was in a perfectly good condition. I examined the service-pipe to Hemstead's house on the evening of the explosion. There was no indication of leakage from it. I afterwards, when it was taken up, tested it under considerable pressure, in the presence of Mr Porter, and there was not the slightest leakage. The soil where the sewer had been made was in an exceedingly soft condition. When the earth was removed I think there was a bend in the service-pipe which crossed the trench. I can hardly charge my memory about it, but from indications I noticed afterwards I think there must have been a bend in it. The soil above the surface was 3 or 4 feet high.

Mr. HUDDLESTON: Will your lordship permit me to ask Mr. David Hunter a question. I do not know whether it is in your lordship's notes that the main was broken in two at the fracture?

Mr. *D. Hunter:* It was; it was in the same condition as it is now upon his lordship's desk. I did not perceive it myself that evening; but when they came to take it from the ground, though the crack was scarcely perceptible, the pipe was completely severed, and in two parts.

Examination of Mr. *J. Hunter* resumed: I observed the next day that the main was broken in two, although it was not perceptible the previous evening, owing to the darkness.

Cross-examined by Mr. ARCHIBALD: The main was not uncovered by the defendant's works. I should think the nearest point of the main to the trench was considerably less than 15 inches. It was very nearly parallel with the cutting, but it was not 15 inches from it all the way, as the cutting was a circular one. At the point where Payne's service was inserted, it was about 15 inches from the main. It was at that spot where the fracture was. After the explosion we dug down to find where the escape was. I should consider that it was the weight upon the service-pipe which caused the fracture. We stripped the main the same evening, and the service-pipe on the other side of the sewer a foot or 18 inches. The ground between the sewer and the main was as hard as you can reasonably expect ground of that kind to be where there is no traffic through the street. I account for the gas from the fractured main getting into Hemstead's house in this way: for a day or two previously there had been an exceedingly severe frost, and the upper crust of the earth would naturally be frozen hard, tending to consolidate it. Underneath that stratum of frozen earth was a stratum of pantiles and broken bricks, 6 or 7 inches, or perhaps more, in thickness; and the gas would very readily pass through that. The distance of the fractured main from the house was about 3 feet 6 inches. When we opened down to the service-pipe there was no indication of gas in the sewer; the main had been laid dead by that time. There was an indication of fresh gas in the ground in the neigbourhood where the fractured main was taken out. There was no indication of a previous escape in the loose ground from the service-pipe. I am not aware that the company have renewed their main in this street since the accident. We have found escapes of gas from fractured mains in other parts of our district where sewers have been formed. I cannot charge my memory with any instance of such a fracture occasioned by the traffic in the streets.

Re-examined by Mr. HUDDLESTON: There is only foot traffic in this street. In more cases than one the contractors have had to make good damage done by them to the company's mains while making sewers. I should say that in this instance the ground underneath the service-pipe, when filled in, was not properly rammed. If it had been, there would have been a sufficiently firm bed for the service-pipe to lie upon to prevent the earth above from bending it, unless a great weight had been put upon it. For ordinary purposes it would be sufficient.

Mr. *Henry Legge*, examined by Mr. HUDDLESTON.

I am a gas-fitter in the employment of the Phœnix Gas Company. On the 15th of February I was sent for on account of the escape of gas at this place. We removed the earth carefully, and when we got down to the service-pipe, we found that the bend which went into the main had been drawn away from the service-pipe about three-eighths of an inch, and was pressed on one side. It presented the appearance of having been drawn out by some force acting like a lever upon it. It might have been by a plank falling on it, or by the weight of the rammer. I did not notice that the main was fractured across that evening. I did so afterwards, and I gave one of the pieces to Mr. J. Hunter. It appeared as if it had been recently broken. Mr. Porter, took one piece from me, and said he did not think it was a new fracture. When I examined the service-pipe, it appeared to me to have been bent down towards the sewer. The soil beneath was in a very soft state. I do not think it had been properly rammed. I have sometimes had to excavate ground, and the practice has always been to well pack your pipes when you go out, and to get the earth solid underneath. If you do, there is no fear of their giving way. There was a layer of bricks and rubbish underneath this main, which permitted the gas to pass through. There was no appearance of the ground being saturated with old gas. You can always tell when that is the case.

Lord Chief Baron POLLOCK: They do not seem to cross-examine upon that.

Cross-examined by Mr. ARCHIBALD: I have been in the employment of the company 11 or 12 years I have never had occasion to take up a main in this street before. I was at the head of the gang engaged to strip this main. We were about two hours before we reached it. I knew where the main was, but being frosty weather we could not get through the ground. We only tried in one place. It might be about 3 or 4 yards across the street that we tried for it. There were four or five men employed working away with their picks and shovels to get down to where we expected to find the main. I found it myself. I did not hit it with my pick nor with the shovel. I found the shovel touched the bend, and then I was very careful in taking the earth out. We found the dead end of the main first, and in opening up the street we came on to the service-pipe which went to Payne's house. I should think it was about 3 feet from where I afterwards found the main broken and the service-pipe forced out. I was very careful in digging the dirt away. We found the service-pipe pressed away three-eighths of an inch. If i had struck the main a heavy blow with the pick, I should undoubtedly have fractured it.

By the COURT: There was no smell of gas then, because the main had been stripped higher up in Coltman Street, by Mr. Hunter's instruction, and a flexible tube had been inserted in the end of it, so that we might have light to go on with the work.

By Mr. ARCHIBALD: We stripped the service-pipe 7 or 8 feet. We did not find any indication of an escape of gas in that part. The service-pipe was bent a little. I have been in the habit of making connexions with gas-mains. We sometimes cut the hole with a gouge, and sometimes drill them. We can drill holes almost as quick as we can cut them. I cannot say whether this hole was punched. In a small-pipe like this, if I were to use a drill I could not get it clear through the pipe; it would go through

the upper part first and leave a certain portion all round, so that I should be obliged to use a gouge, and not make so good a hole after all. The fracture in the main looked to me quite recent. I did not examine the piece broken out before I handed it to Mr. James Hunter. I did not see the fractured portion of the main when it was uncovered on the night of the explosion.

By the COURT: Before we opened the place where the service went to Payne's we had put on the elastic tube up above. That stopped the escape of gas, and put an end to the use of my nose.

By Mr. ARCHIBALD: I saw the fracture readily next morning when I went down. The short piece was drawn away from the other part about the eighth of an inch. I did not mention the circumstance of the main being broken across to any one; it was not my business. I mentioned it to young master—young Mr. Hunter—when there, and he and I went down together on purpose to see it next morning.

Re-examined by Mr. HUDDLESTON: We were two hours the night before looking for the fractured part of the main; we had no plan with us, but I knew it was in Coltman Street. We stripped it for a length of 3 or 4 or 5 yards, I cannot say exactly how far, before we came to it. The main was about 18 inches below the surface, and we were very careful as we got near to it that we did not touch it. The explosion had taken place two hours before we dug down to it. The iron of which the service-pipe is made will give a little under pressure and resume its position when that is taken off. By being careful I can, on a main of this size, make a hole with a punch and rymer which shall be as gas-tight as if made with a drill.

John Pedder, examined by Mr. MATHEW.

I was one of the workmen employed to remove the soil in company with the last witness. We were very careful in doing so. [Witness deposed to the finding of the service-pipe and to the condition of the soil in which it was imbedded.] I remained watching the place all night, and was present the next morning when the pipe was examined. I found out that the main was fractured in the middle of the night. As I was stopping there, I thought I would go and have a look at it. I did not point out the fact next morning; I kept it to myself. It was a recent fracture, and I put some boards over it to protect it from the dirt, so that the inspector might see it in the morning.

Cross-examined by Mr. JAMES: I was present all the time the ground was opened. I felt the escape of gas blowing in my face before we got to the main. It was very strong indeed. We had no candle; it would have exploded the gas if we had. I should not like to have had one there. I was in court when Mr. Hunter was examined. I went with him and the other men for the purpose of cutting off the gas before we proceeded to uncover this part, lest there should be some mischief.

Mr. JAMES: Did you hear Mr. Hunter say that the gas was all cut off?

Lord Chief Baron POLLOCK: No; what he said was this, that he put on a flexible tube.

Witness: That was when we cut the main in two to get a light to see by.

Mr. JAMES. But, if I mistake not, Mr. Hunter said that they cut it off before they bared this part.

Lord Chief Baron POLLOCK: I will give you his very language—"There was a large escape of gas; I directed the workmen to find out the main: I directed them to strip the main and insert a flexible tube to give light. The escape ceased; then we stripped the main and went to the corner, and found the main fractured."

Cross-examination continued: When we were searching for the main the gas came out into my face from where the bend was forced out. That was before the flexible tube was inserted. There were two of Porter's men remained with me during the night and two policemen. I do not know whether the policemen are here. I did not tell the other men that the main was broken in two; I kept it snug to myself. I first disclosed it just now. I used a pick several times that night at this work, but not after the other men left. I have never known but one explosion taking place besides this. That was in Union Street, about half a mile off, five or six weeks before.

Re-examined by Mr. HUDDLESTON: I do not think that explosion was occasioned by the gas. When I used the pick on the night of the explosion I used it carefully, and I neither touched the main nor the service-pipe with it.

Richard Turk, another workman, gave similar testimony as to the opening of the ground and taking up the main.

Mr. *Gibbons*, Mr. *Child*, and Mr. *Denton*, three inspectors in the service of the gas company, deposed to having taken the register of the meter at Hemstead's house at various times since August last, and to the absence of any indications of escape of gas on those occasions, or of any complaints on the subject.

William Spring, *James Cassels*, and *Charles Carter*, three labourers, formerly in the employment of Mr. Dethick, the defendant, severally deposed that they were engaged in February last upon the sewerage work in question, that in their opinion, and according to their experience, the filling in and ramming down of the earth afterwards was very imperfectly done, and that Mr. Poole, the inspector for the Metropolitan Board, had complained to Mr. Spurgeon, the superintendent, in their hearing, upon the subject. The last of these witnesses said that he did not perceive any smell of gas before two or three o'clock in the afternoon of the day on which the explosion took place.

Thomas Smith, a watchman, employed by the defendant at the works in Coltman Street, deposed that until the evening of the explosion he had never perceived any escape of gas. That evening he went on the works with eight lanterns, about five o'clock. The defendant's men were then filling in the trench in front of Hemstead's house. He smelt the gas very strong at that time, and shortly afterwards the explosion took place.

Thomas Hawksley, Esq., examined by Mr. MATHEW.

I am a civil engineer of great experience in connexion with gas and water works. I have examined this main and service-pipe. I am able to form an opinion as to the cause of what I can see. It is a very common kind of accident. I do not mean the explosion, but the fracture. It is a thing we meet with constantly in making sewer-works, and in digging deep trenches for any other purpose. I make a great number of sewer-works myself—that is a branch of business which as an engineer I practise; and both as a gas and water engineer as well as a designer of sewers, I know perfectly well that accidents of a precisely similar kind to this are constantly occurring. This fracture does not present any indication of having been of long standing. The pipes were brought up to my office to be examined about two months ago—I believe as soon as they were taken out of the ground. I examined them very carefully at that time, and afterwards I went down to the place where the accident occurred. I informed myself by plans and sections, and by having the ground opened, of the exact position of the pipes and sewer, and I can describe, I think, very accurately how the accident did arise, for, as I said before, it is a very common kind of accident.

Lord Chief Baron POLLOCK (interrupting witness): Now you see, Mr. Hawksley, I must take care that you, as a gentleman of experience and science, do not absolutely substitute yourself for the jury. (To Mr. Mathew:) You must be a little cautious in putting your questions so as not to get Mr. Hawksley to answer any question which is fitly and properly for the jury.

Mr. MATHEW: Have you examined the pipes?

Witness: I have.

Mr. MATHEW: Does this fracture appear to be caused by force or not?

Witness: Certainly.

Lord Chief Baron POLLOCK: Are they old fractures, or do they appear to correspond with the time when this explosion took place?

Witness: I think with the time of the explosion.

Mr. MATHEW: Assuming that the earth under the service-pipe had not been properly rammed in, and that a quantity of soil had been heaped on the service-pipe, would that account for what you saw?

Witness: It would occasion leverage upon the pipe, which might break out of the upper part of the main in the way I saw. But I apprehend that two causes of the same kind were at work.

Mr. ARCHIBALD objected.

Witness: There was a piece of main broken out afterwards, which indicated to me that pressure had been brought to bear upon the service-pipe, which had the effect of breaking it out from the main. I examined the condition of the main in the other parts of it. The iron was perfectly sound. It is a very good pipe. The appearance it presents arises only from concretions upon the surface which are usual when a pipe is long in the ground. A little oxide of iron binds the sand and gravel together around it. It is a good sound pipe where it is broken in two. I dare say that happened in this way.

Mr. ARCHIBALD again objected.

Mr. MATHEW: Would the same cause—pressure upon the service-pipe—have accounted for that?

Witness: I think not, and that is the reason I was about to explain what I believe was the cause.

Mr. ARCHIBALD: I object, if you are going to explain the cause of it. It is going altogether beyond the limit.

Lord Chief Baron POLLOCK: I do not know. I think we ought to hear it. Supposing Mr. Hawksley is going to say, "I do not think you are quite right in one view of it, but I think there is another view which is." That is a matter which we should hear. If he were to say "in my judgment it was the fault of the defendant," or "the fault of the plaintiff," I should not allow that answer.

Mr. MATHEW: Will you tell us what in your judgment was the cause of the fracture of the main?

Witness: In my opinion, it was nothing but the pressure of the weight on the end of the main. [Witness explained by the model the relative positions of the pipes and the trench.] The removal of the struts caused the ground to subside, and left the pressure on the end of the main, which cracked it through. The filling in brought pressure upon the service-pipe. The two forces were acting together, and no doubt the piece at the top was broken out at the time the pipe divided transversely.

Examination continued: I cannot say whether there were any indications in the ground of the gas having been for a long time escaping, because I did not examine it till a considerable time afterwards. I am not therefore justified in offering an opinion. I examined the ground between the main and Hemstead's house. It consisted of broken pots and tiles as though there had been a pottery there some time or other. The pieces were placed one upon another loosely, so that the gas escaping could readily diffuse itself through them under the house. The soil was perfectly open.

Cross-examined by Mr. ARCHIBALD: I do not know whether that end of the street is higher than the other. The gas would pass along the line of least resistance until it found a way of escape. There was a boarded floor over those rough tiles in Hemstead's house; the gas found its way through and something having occurred to light it, the whole blew up. The model produced was constructed not under my direction, but by my advice. I have never seen it before to-day.

Mr. ARCHIBALD: You say that you have superintended a great deal of sewerage works as an engineer. Does the danger of injury to these pipes consist in the reckless way in which the men dig and work in the neighbourhood?

Witness: Yes; and sometimes by gradual subsidence continued over a long course of time, after the trench of the sewer has been filled up even with very great care.

Mr. ARCHIBALD: And sometimes by the reckless use of the pick?

Witness: It is quite possible to break a pipe of that size with a heavy blow of a pick; but there is no indication of such a thing here. The pipe is not fractured at a place likely to be struck by a pick; it is broken at the drilled hole.

Cross-examination continued: It depends upon the nature of the instrument used whether the mark of the blow would be visible. This pipe is of the usual kind; there is nothing remarkable about it in reference to strength. If the service-pipe had been loosely inserted the leverage would not be sufficient to break it; but tapped in as this was and made firm, it would bring the piece with it.

By the COURT: There is no practical difference between punching and drilling, if the work is well done. There is a greater risk of injuring the pipe by a heavy blow from the maul in the case of punching, but I believe it will be seen that that was not the case here. If you look at the piece of pipe, you will see that nothing has been broken out from the inside of the hole.

By Mr. ARCHIBALD: If the hole were not tapped it would not be at all difficult to knock out the service-pipe with a blow without injuring the main.

Mr. HUDDLESTON: You must not assume that the hole was not tapped; the evidence is the other way.

Mr. ARCHIBALD: Supposing the whole of the main firmly imbedded in the ground, and that the only part open was where the service-pipe was connected, it would be still more easy to knock out the service-pipe without injury to the main.

Witness: I do not think that would make any difference.

Mr. ARCHIBALD: Supposing the service-pipe covered as well, and the whole supported in soil 15 inches in thickness, a blow on the end of the service-pipe might still separate it from the main without injuring the main?

Witness: Yes; there being no screw.

Mr. ARCHIBALD: In fact, would it not take a great deal of force to fracture a main like that?

Witness: It would; but I ought to mention that these small pipes are

more brittle than larger ones, because in consequence of their comparative thinness they cool more rapidly, and the iron assumes a vitreous texture.

Re-examined by Mr. HUDDLESTON: The reason why with small pipes punching is adopted is the very small radius of the curvature. When the drill is used it cuts through the central portion before it has cut the outside portion of the hole. The workmen therefore prefer to cut out the piece with a chisel rather than drill it. There is no difficulty in effecting the junction with the service-pipe by means of a hole that has been punched, providing it is properly done.

Mr. HUDDLESTON: My friend has asked about the force that would be necessary to fracture the main. I take it that if you have a leverage such as this wrought-iron service-pipe a considerable distance from the main, coming in where you have that bend, the leverage is immense?

Witness: That depends upon the length of the lever, and the weight upon it.

Mr. HUDDLESTON: Supposing the weight, as we have it here—assuming that the ground gave way where the sewer is, and the consequence was that the service-pipe was bent—considering the extent of the leverage where the pipe goes into the main, would that account for the fracture in the main?

Witness: Yes; in the upper part of the pipe.

Mr. HUDDLESTON: Then how do you account for the main being split in two?

Witness: Simply by the weight at the end of the pipe, They were both acting at the same moment, and, of course, the one would weaken, as it were, the resistance of the pipe, and so render the effect of the other more easily accomplished.

Mr. HUDDLESTON: My friend has asked whether a blow with a pick might cause the breaking of the main.

Witness: The transverse fracture is quite capable of being produced by a blow with a pick, but the pick would leave its mark.

Mr. HUDDLESTON: Can you account for the explosion two hours before if the blow was made with a pick two hours after?

Mr. ARCHIBALD objected to the question.

TUESDAY, JULY 4.

Mr. *Richard Carbine*, examined by Mr. MATHEW.

I am a member of the firm of Carbine and Riches, Surrey Iron Foundry, Gravel Lane. I have been engaged in iron-works all my life. I have examined the main and service-pipe produced. They appear to be perfectly sound and good. I have heard some of the evidence as to the appearance which the main presented on the occasion when the ground was opened. Supposing the service-pipe to be in the position described, and to be operated upon in the way which has been spoken of by means of the earth pressing upon it at that distance from the main, it would, in my opinion, account for the fracture. The main was tapped to receive the service-pipe. By some unfair usage the service-pipe has wrenched the thread from the main at the same time that the fracture took place. There are the remains of the thread to be seen on the main now. I am prepared to swear that the main is a tapped pipe; whether it was punched or drilled is immaterial; the joint was a perfect joint. In either case the thread would be made afterwards, and the junction with the main would be equally good in either case.

Cross-examined by Mr. JAMES: We are in business for ourselves. We do work occasionally for the Phœnix Gas Company, and have done so for six or seven years, but not their principal work. Frost will affect iron if exposed to the air, by rendering it more brittle. In my opinion it would not affect it if buried 15 inches below the surface of the ground. I am prepared to swear that there is no flaw in this main. If the pipe had been cracked the gas would have made its escape long before, and the flaw would have been detected. I have seen the whole of the pipe, and there is no flaw in it at all. In punching a hole there is more liability on the part of the workman to make a fracture than in drilling.

Re-examined by Mr. MATHEW: There is no indication here that there had been a fracture when this pipe was punched.

Mr. *W. R. Morris*, examined by Mr. MATHEW.

I am engineer of the Kent Water-Works Company, and have had more than 40 years experience in iron. I have examined this main and service-pipe. I saw the main in March last, and at that time the fracture was, undoubtedly, a recent one. There was no appearance of an old flaw. When I saw the main it was at the Phœnix Gas-Works. I have not examined the ground from which it was taken with sufficient minuteness to be able to say whether there were any appearances of an old leakage of gas; there were none upon the iron. The main in other parts was good average iron, and perfectly sound. The fracture was upwards and outwards on one side, and the pipe divided into two, longitudinally. I have heard what was the position of the service-pipe rising from the main and crossing the sewer to Payne's house. Assuming that that service-pipe rested on soil imperfectly rammed, and that a quantity of soil was heaped above it, that would, in my opinion, account for what took place.

Mr. JAMES: Assuming there were some 3 feet or 3 feet 6 inches of solid earth between the edge of the cutting and the junction of the service-pipe, in which earth the service-pipe is solidly imbedded, in your judgment, if such an effect was produced, would it not disturb the earth over it? Would not the shorter part of the lever have produced some disturbance of the earth?

Witness: I think not.

Mr. JAMES: However solidly imbedded?

Witness: That is another matter. Taking it in the ordinary sense, the disturbance would be so very slight that it would be hardly perceived—it would be a mere jerk.

Cross-examination continued: I assume that the weight of the earth over the service-pipe in the trench would raise the other end slightly, and to that I attribute the fracture. If the lever formed by the pipe bent, the work of displacement would not be done; the more rigidity the lever had, the greater would be the effect at the other end of the pipe. If I heard that the pipe was bent it would not raise the inference in my mind that this was not the cause of the mischief. The power of the lever would be less, but in either case it would be quite sufficient to break the pipe.

Re-examined by Mr. MATHEW: The bending of the pipe would not be sufficient to detach it from the main. Part of the power was applied to raising the pipe, and part to bending it.

Mr. MATHEW: You have been asked to assume that the main was imbedded in hard soil.

Mr. JAMES: In distance, not in depth.

Witness: I do not know how it was, one way or the other.

Lord Chief Baron POLLOCK: The evidence is that it was imbedded horizontally, not more than 15 inches. It was put expressly to one of the witnesses, whether it was 3 feet, and he said "No, only 15 inches." The answer of the present witness is that the pipe might be bent and the disturbance of the soil might be imperceptible, and yet it might break the pipe.

Witness: Just so.

Mr. *Alfred Williams* was called, but the learned judge said, on hearing the nature of his proposed evidence, that he protested against more than three scientific witnesses being called to explain a scientific fact; it was quite unusual, and he believed the master would not allow costs.

Mr. HUDDLESTON: These are gentlemen who have tested the pipes.

Lord Chief Baron POLLOCK: I think in discussing a question of this sort some regard should be had to what is reasonable. I think it is a very absurd thing; I think it is oppressive on the part of the company to go all over England and call a dozen witnesses of great name to do what, if it can be done by three, should be so done.

Mr. HUDDLESTON said it was agreed that the damages, if the verdict were for the plaintiff, should be taken at five guineas.

This was the plaintiffs case.

Mr. JAMES said he had the honour to appear on behalf of the defendant, who, being the contractor for the sewerage works in question, was charged by this powerful company with having been guilty of negligence, and so causing disasters which, according to the representations of his learned friend who opened their case, were, if not immeasurable, certainly very great. For, as Mr. Huddleston had stated, it was not merely the present case which had to be decided, and there an end, but considerations were involved in this question which were of a much more extensive character. Either Mr. Dethick, on the one hand, or the gas company on the other, was responsible for all the mischief consequent to individuals or property by reason of the escape of gas which had taken place; and if the company should succeed in satisfying the jury by the evidence that the defendant was the party to blame, the result to him would be most disastrous. He (Mr. James) used this argument simply for the purpose of inviting the most careful consideration of the jury to the case before them, and not for the purpose of creating any undue sympathy in their minds in favour of an individual and against this powerful company. It would be an unfair act on his part if he were to attempt to do so; and, as he had stated, he only mentioned it in order to ask their attentive consideration to the facts and probabilities before they gave a verdict which would entail such heavy consequences upon his client. Mr. Dethick was contractor for these works, under the Metropolis Local Management Act, and he had faithfully, carefully, and conscientiously, and to the satisfaction of his employers, the Metropolitan Board of Works, performed the whole of the work entrusted to him. The only instance in which it could be urged against him, even by way of suggestion, that he had done anything wrong was in this individual case. Throughout the whole of this work he had adopted the same course that he had pursued in every other case as regarded the digging, strutting, and giving of notices, &c., to the different parties affected. This was a public work, for the benefit of the public; the Board of Works were authorised by Statute to perform it, and they were protected from the consequence of everything they did in the due discharge of the duty entrusted to them by the Legislature. Their contractors, also, to the same extent, were protected in the due discharge of their functions. But in no case were they exonerated from responsibility for any negligent act on their parts. They were bound to use due care in the performance of their duties, and they were not exonerated from the consequences if they conducted their works negligently. The question here was whether the defendant had so acted. It might be—because a great deal that had been stated was matter of pure speculation—that in this case other causes had been at work which had contributed to the mischief in question; and he thought his lordship would tell the jury that if on the part of the gas company there had beeen any fault whatsoever, which, in conjunction—supposing there had been negligence on the part of Mr. Dethick—produced the disaster, the defendant would not be responsible. In all cases where one person charged another with damage arising from his negligence, the one who made the charge must himself be free from blame in everything as respected the mischief itself. If in any way he had contributed to that mischief, he was not entitled to recover from another who might have been guilty of negligence likewise, and thus have brought about the result.

Lord Chief Baron POLLOCK said the learned counsel could not lay that down as a universal rule, because in a great many cases a man might be guilty of some negligence. The general question was, who is really the cause of the mischief. It did not at all follow that a man was not entitled to redress because if he himself had done something different it would not have occurred.

Mr. JAMES said he was bound to accept the law from the bench, but he ventured to submit that what he had stated was the view he had taken of the matter. But the great question here was, whether there had been any negligence at all on the part of the defendant; because if there had not, although it might happen that there had been a fracture in the main and a separation of the service-pipe, unless the jury could bring themselves into such a frame of mind as to be reasonably assured that the mischief had been occasioned by such negligence, he was convinced that they would not speculate upon possibilities, and chances, and probabilities, in determining a question of fact. The allegation on the part of the plaintiffs was that in filling up the trench beneath the service-pipe the earth was so negligently and carelessly rammed down that it became an insecure support for such service-pipe; and that when the superincumbent earth was filled in it became bent, and by the weight upon it was drawn out of the main at the other end, which main was actually broken asunder, causing the escape of gas which led to the explosion. After commenting upon the evidence which had been given in support of the plaintiffs case, the learned counsel said the only allegation which was made against the defendant was that of not sufficiently ramming down the earth beneath the service-pipe. On behalf of the defendant he should call a number of witnesses who would prove that the work was well and properly done, and that an escape of gas was perceptible, and had been made the subject of remark before the operation of filling in the trench commenced. It was not for the defendant to account for the causes which led to the explosion, nor was it for the jury to speculate upon what those causes were; their duty was only to say whether or not any act of the defendant's had led to the disaster. They might be satisfied that if the trench had not been dug at all, the explosion would not have occurred, but that would not be sufficient to make the defendant liable. He had a right to dig the trench; the Legislature had authorized and empowered him to do it, and he was protected in the due discharge of his duty; and he (Mr. James) had little doubt that the result of this inquiry would be to convince them that it had been properly and efficiently performed.

Mr. *James Porter*, examined by Mr. PAYNE.

I am one of the defendant's managers, and superintended the works at Greenwich, which were carried out under contract with the Metropolitan

Board of Works. Notice was given to the plaintiffs of the intention to make the drain in Coltman Street. It was commenced on the 6th of February last. It was a branch from the main sewer in Thames Street, and was 15 and 12 inches in diameter. The depth of the cutting was 14 or 15 feet, and the width, without the timbers, 3 feet 6 inches. I have measured the distance from the edge of the trench to the point where the main was fractured, and find it was 3 feet 2 inches. The cutting at no point whatever came close to the end of the main.

By the JURY: The ground under the end of the main was never removed at all.

By Mr. PAYNE: The model [produced by plaintiffs] which represents the main as coming up to the edge of the trench is incorrect. We commenced filling up the trench on the 13th, at the end nearest Thames Street, and followed it up Coltman Street. [Witness described the method of making the trench.] The whole was done in a workmanlike manner, and to the satisfaction of the officers of the board. We commenced filling in by shovelling the earth which lay near, and there were men below who spread it out in 6-inch layers. It was then punned and rammed down; when we got further on the earth was tipped in from a barrow. I saw the ground under the service-pipe properly filled up and rammed. I should think the trench was half filled up on the morning of Feb. 15, and the level of the service-pipe was reached in the afternoon of that day. It was first covered over about five o'clock, and that was done at the request of Mr. Spurgeon and Mr. Poole, the servants of the board. The distance between that pipe and the surface of the ground was about 12 inches, and there were not more than 18 inches of earth heaped upon it in all. It is not true that it was piled up 3 or 4 feet above the level of the road. The soil round the service-pipe which crossed the cutting, was very solid mixed earth. I am certain, in my own mind, that the 18 inches of material which was perpendicularly over that pipe could not have produced the fracture in question. I left the place when the men gave over work, at half-past five o'clock. I did not perceive any smell of gas then; if I had I should not have gone away. I returned to the place immediately after I heard of the explosion; that was between seven and eight o'clock. I found the company's men there. They were then digging in Thames Street, near our previous cutting.

Lord Chief Baron POLLOCK: I take it that you were moving about from place to place during the time you were superintending the works?

Witness: Yes, my lord.

Lord Chief Baron POLLOCK: I will tell you what I want to get at. It is said that some one observed a smell of gas at two o'clock. Do you think there is any truth in that?

Witness: I think so, from the statement of the men there.

Lord Chief Baron POLLOCK: Do you think the gas could have been escaping before you left at half-past five.

Witness: I cannot tell; I never smelt it myself.

Examination continued: I believe the company's men were working for two hours before they discovered the main in Coltman Street. I think it was past ten o'clock. They worked with the pick and shovel. I was present when the main was exposed at the point of junction with the service-pipe. It was fractured. I first saw the service-pipe, and then I found a piece of pipe. [Produced.] The service-pipe was on top of the main, with a bend to cause it to go in a horizontal direction; and the junction was made by a punched hole, which had been rymed out, but not cleverly done, by any means. I should think this was a proper method of inserting a service. I do not know whether it is at all material; I should think it is a proper way, so far as the arrangement went. The drilling of such a hole is the safest method, as in punching a fracture may be produced.

By the COURT: They are both usual methods. For economy of time, punching is adopted; for better workmanship, drilling. Frequently in punching a piece of main is broken out larger than the radius; consequently no rymer is of any use. It is so here; the hole is larger in diameter than the service-pipe.

Lord Chief Baron POLLOCK: Then how came the gas not to escape before?

Witness: I cannot account for it, unless it was prevented by rust or corrosion. The men would take care to stop it up temporarily at the time with a little acid and iron.

By Mr. PAYNE: In punching, the hole is not made thoroughly round. There would not necessarily be an escape of gas at the time if the pipe was fractured in this way. I cannot tell how soon after it might be. If the fractured parts were not displaced, the earth being all round, it might go on for a considerable time. I examined this fracture, and in my opinion it is a very old one, from the rusty appearance of it. I am perfectly clear that it was so. I examined the main very carefully—more than once—at the time. I found the fractured hole where this piece came out, but nothing more; the pipe was apparently sound across it. There was no opening at all, and no sign of the main being broken in two.

By the COURT: The appearance of the main where the pieces came from was that of an old fracture. I first heard of the main being broken in two when I saw it at Mr. Innes's office, Bankside. I had no conception of it till then. That was about a week ago.

Mr. PAYNE: Did you then make any remark about it?

Lord Chief Baron POLLOCK: I think you cannot ask that.

Mr. PAYNE: Was any remark made to you about it?

Lord Chief Baron POLLOCK: I think you cannot ask that.

Mr. PAYNE: It was said yesterday by one of the scientific witnesses that the fracture in the main was probably caused by a settlement of the ground. Was there any appearance of a settlement along the work you did?

Witness: Not the slightest.

Mr. PAYNE: Do you know that every precaution was taken by the defendant to prevent any injury to the gas-pipes?

Witness: Quite so.

Cross-examined by Mr. HUDDLESTON: I had the management of this work, and if there were any negligence I suppose I should be the person to blame for it. I am not acquainted with the manufacture of gas-pipes. Mr. Dethick is a general contractor, not a contractor for making iron pipes. I have been brought up to the earthwork business; I have no objection to be called a "navvy." I am not a gas-pipe maker. I have never been employed in iron-works. I have worked at fixing pipes. I laid a great many pipes in connexion with the Putney aqueduct. I have never had any practice in gas-works. I have had no experience in joining gas-pipes; I never joined one in my life. I have seen it done in connexion with our work at Greenwich. We have frequently had to have the gas-pipes removed in the case of side entrances. I have seen a great many fractured pipes. I cannot tell how long this main had been fractured; apparently a very long time; but the pieces had not been displaced. I made the plan produced. I have seen the model, and I mean to say it is not correct. During the whole time this model was in the court yesterday, I was here, sitting beside, and in communication with our solicitor. I did suggest to him that the curve of the sewer was not where it is represented. I believe he mentioned it to counsel, but there was no cross-examination upon it; my complaint was not made public.

Mr. HUDDLESTON said if there was any doubt in the minds of the jury whether the plan was correct, he would recall a witness to prove that the curve was in the right position. On the plan prepared by the witness the curve of the sewer was made out of the pavement instead of at the right spot.

Cross-examination continued: I measured the distance from the fracture to the edge of the sewer the day after the explosion in the presence of some of our men. I have not got the original measurements with me; they are at home. I was about the place all the time the works were in progress. It would have been my duty to communicate with the gas company if there had been any extraordinary appearance of an escape of gas. We scarcely ever open the ground without smelling gas. I did not perceive any escape here at all. I measured the distance from the service-pipe to the surface of the ground after the explosion. I did not measure the depth of the filling in. I did not make any memorandum of my measurements. We left 6 inches of soil above the road for subsidence.

Re-examined by Mr. PAYNE: Our foreman superintended the filling in. There was no part of the work let to a sub-contractor; it was all done by our own men. I cannot say whether Mr. Lindo, the solicitor in this case, told counsel of my complaint that the model was incorrect; it was not made public.

W. Wren, examined by Mr. PAYNE.

I am a ganger employed by the defendant, and was engaged in the construction of this sewer from the commencement. The excavation was properly made, and timbered every 3 feet. When the lowest timber was removed the ground on each side was as solid as a rock. It is usual to support a service-pipe if it is uncovered for any length, but not for a short distance like this. I was present when the excavation was being filled up, and personally superintended the ramming, which was properly and effectually done to my own satisfaction and that of the officers of the board, who were always on the ground. In fact, if it had not been done to their satisfaction they would have stopped the works. The only complaint that Mr. Poole ever made was about the tipping of the rubbish on the concrete on the top of the sewer pipes. During the time the excavation was going on I smelt the gas. It was on the 14th and on the 15th of February, both. I spoke of it to Mr. Hemstead.

By the COURT: Mr. Porter was not there at the time, but I told him of it afterwards, and I spoke of it to the men who were working there. I spoke to Mr. Porter about it on the 15th, not on the 14th. I said to him "There is an escape of gas somewhere." He said "Is there?" And I said "Yes, it is very strong."

By the JURY: I spoke to Hemstead about it on the 15th, before dinner, and to Porter immediately afterwards. I said to Hemstead, "What an escape of gas," and he said "It is in my back room; we scarcely know how to live in it."

Lord Chief Baron POLLOCK: We have nothing to do with Mr. Hemstead; it is not evidence. What did Porter say?

Witness: He said, "It must be seen to." This was on the 15th, somewhere a little before twelve o'clock, as near as I can recollect.

By the COURT: I was not down in the excavation during the progress of the works; I was at the top, and I smelt it there. When I pointed out the escape to Porter, he smelt it. It was at the lower end of the street when I spoke to him.

By Mr. PAYNE: Before the 14th I had smelt the gas as I passed up and down the works at that corner, but not at any other part. Mr. Poole gave orders in the afternoon of the 15th to have the trench filled up a little further than it had been done, and the men stopped later that evening for the purpose. They filled it up just beyond where the service-pipe crossed the cutting, in order to make more room for the foot passengers to pass. I was there when it was filled up. It was about a quarter to five when the last 12 inches were filled in. There was nothing done at that time to cause a fracture of the service-pipe or main. The soil was put on the pipe, but not rammed on the top, so that it laid lightly there, and the men only trod it down with their feet. That is the most usual method of filling up over a small service-pipe.

By the COURT: There were three men treading with their feet over the service-pipe.

By Mr. PAYNE: They would not all three be upon it at the same time. On either side of the trench the ground was frozen hard, and would have borne a much heavier weight than was put upon the service-pipe. I left the works that evening at about 20 minutes past five, and did not go back that night. The next morning I examined the ground where the explosion had taken place. I did not notice any crack; it was as firm as when I left it the previous evening, except where the gas company's men had disturbed it. The main-pipe looked to me to be older looking than usual. It was not broken across then. I stand here and solemnly swear before God and man that I am telling the truth. It is not true what the men said about the work not having been done properly. They said that because of some enmity they have to me or Mr. Porter for discharging them. The fracture in the main appeared to me to be an old one; it was of a dark colour. I did not measure the distance between the main and the cutting; it was about 1 foot or 15 inches.

Lord Chief Baron POLLOCK (to Mr. Payne): There is the mischief of putting such a question to a man who did not measure it, and knows nothing about it. He says it was 1 foot or 15 inches, and your own witness, who did measure it, says it was 3 feet.

Cross-examined by Mr. HUDDLESTON: I am superintendent under Mr. Porter, and have to forward the work as fast as I can. I suppose I should be the person to be blamed if there were anything wrong. I smelt the gas on the 14th and 15th. I saw Mr. Porter every day. I did not mention it to him on the 14th. The smell of gas was *very* bad then. I was not alarmed about it at that time. On the 15th it was much worse; no one could help smelling it who was passing by. Mr. Porter said it ought to be seen to. I suppose, by rights, I ought to have seen to it. I did not do so. Mr. Porter was near to Hemstead's house on the 15th, where I smelt the gas *very* strong I don't know whether he smelt it. Nobody could help doing so who had a nose. There was no mistake about the fracture in the main-pipe appearing to be an old one.

Re-examined by Mr. GRANTHAM: When near a gas-pipe in an excavation of this kind, it is not unusual to smell gas. Where gas-pipes are laid the ground usually stinks of it. Most gas and water companies have men on the spot when works of this kind are going on, to see that all is right.

Mr. *John Pedley*, assistant-ganger, gave similar testimony as to the progress and mode of carrying on the work. He said he smelt the gas on the 14th, at the entry of Hemstead's house, and also on the morning of the 15th, when he called the attention of Mr. Poole, the inspector, to it. In the afternoon of that day he smelt it again at the same spot. The main-pipe, when

he examined it after the explosion, was not broken in two, and the fracture in the top of it, according to his experience in iron pipes, was an old fracture. He believed the weight of earth on the service-pipe would have no injurious effect upon it whatever.

Lord Chief Baron POLLOCK said it was no use talking about the weight of the earth when it had already been proved that there was also the weight of the men treading it down.

Witness said he believed it would bear the weight of twenty men.

Mr. PAYNE inquired whether it was true that there were 3 or 4 feet of earth piled up above the level of the road.

Lord Chief Baron POLLOCK said the answer to that question might be important for the purpose of testing the veracity of the witnesses, but it was utterly unimportant with reference to the cause of the explosion. In the plaintiff's case there was nothing said about the men treading down the earth, and the fact of a man treading down 6 inches of earth was a more important one than the question of 3 or 4 feet of earth above the pipe.

Witness, in the course of his examination, said he had been employed by Sir Samuel Morton Peto and others in excavations, and from his experience he believed that the ground being well rammed around the service-pipe as this was formed a sufficient support for it.

In cross-examination he admitted that if the ground was not well rammed underneath the pipe the treading of the men on the surface would have an injurious effect upon the pipe. He did not, however, think it would injure the junction with the main at that time, because the earth where it lay was frozen so hard. Although he smelt the gas so powerfully on the 14th and on the 15th, before the explosion, and knew that the company's works were within 150 yards of the place, he did not think it his duty to inform them of it. He did not tell Mr. Porter, although he saw him on both days.

Mr. *John Poole*, examined by Mr. PAYNE.

I am an inspector, employed by the Metropolitan Board. It was my duty to inspect the works done in Coltman Street, and see that they were properly done. We never punn the earth over the service-pipes, it is only pressed down by treading. I gave orders on the day of the explosion that the earth should be put in the trench to cover the pipes altogether, and to make the path level. That was done about five o'clock. There was a smell of gas hours before the explosion. It was a little before three o'clock when I first smelt it, before I had given orders to cover up the pipe. I did not think the escape was from the pipe, but from the house; I was standing before the shop-door at the time, The ground between the main-pipe and the trench—about 3 feet—was perfectly solid, and, as the service-pipe rested in solid ground on both sides of the cutting, the weight of earth upon it, and the men treading upon that earth, could not possibly have affected the junction of it with the main. Every precaution was taken to prevent injury to the company's pipes. I found fault with the way in which the work was done often enough; it is necessary to find fault in order to get it well done. We never had any work done better than this.

Cross-examined by Mr. HUDDLESTON: I did not make complaints to the company about the smell of the gas; I understood that the man at the shop went to the works about it.

Mr. *Spurgeon*, examined by Mr. PAYNE.

I am in the employ of the Board of Works, and superintended the laying of the sewer in Coltman Street. The excavation and the filling in were properly done; it was done in the usual manner. I did not see the service-pipe covered. I gave instructions to have it done. I left the place, and returned about ten minutes after the explosion. The company's men were not at work then. When they came they did not know where the main was; they began digging in Thames Street. I examined the main on the following day. In my opinion the fracture was an old one; it had all the appearance of it. The portions which were broken were rusty and black. I did not notice any traces of old gas in the ground. The service-pipe rested in firmly-made ground—perfectly solid; it appeared to have been made for years. Resting, as it did, in solid ground, the weight of the earth upon it could not have affected its junction with the main at a distance of 3 feet from the trench.

George Pollen, *Robert Brown*, and *William Wren*, three "timber men" were next called, but their evidence was of no importance in the case, for, as the learned judge remarked in summing up, they knew nothing about the matter. *Henry Pedley*, a "navvy," was also called to prove that the filling in and "punning" of the earth in the trench was properly done.

Mr. *Mark Hemstead*, examined by Mr. PAYNE.

I was the occupier of the house which unfortunately was blown down by the explosion. I first perceived the smell of gas about two o'clock on the afternoon of that day. About four o'clock a neighbour came in and said she smelt the gas in her house. I tried all my pipes and my meter, and found there was no escape. I took a candle and tried all my pipes and the boards in the lower part of house, and finding no escape I thought the smell came from the sewer, for where there is a sewer there is generally a smell of gas. I did not see Mr. Hunter till after the explosion.

Cross-examined by Mr. HUDDLESTON: I am the plaintiff in the next case. I did not perceive any smell of gas on the 14th. I am quite sure of that; I must have noticed it if there had been. Wren did not call my attention to it that day; that I am positive of. He never called my attention to it. No one ever did so till my neighbour came in from the next house, about four o'clock, on the 15th. When I smelt the gas I did not go to the company's works about it. I did not think there was any occasion to do so. The gas smelt quite as much outside the door as in the house. It did not seem so much in my house as in the next. I do not see how one of the witnesses could say that there was a dreadful smell in my house, for he did not come in.

A JURYMAN: We have heard from both Wren and Pedley that on the 14th and 15th they mentioned the smell of gas to you?

Witness: I heard their evidence, but it was not mentioned to me. (To the Court:) It is not true that any one mentioned it to me.

Richard H. Calcott, examined by Mr. GRANTHAM.

I am a waterman, and at the time in question I lived next door to Hemstead. The gas was not laid on in my house. On the 15th of February I smelt gas in the lower part of the house—in the coal cellar—the first thing in the morning, about half-past six o'clock. I smelt it again at dinner-time, when it was stronger; and when I came home at five o'clock it was stronger still. It continued so till the explosion took place.

Cross-examined by Mr. HUDDLESTON: I was first spoken to about coming here last Tuesday.

Josiah Edman, examined by Mr. PAYNE.

I am a labourer in the employ of the defendant, and lived in Hemstead's house. I went to my tea just before five o'clock on the 15th of February. I perceived the smell of gas in the back room. That was a little while before the explosion.

Cross-examined by Mr. HUDDLESTON: I had not been at work that afternoon. I did not perceive the smell of gas till I went into Hemstead's house. I was going to light my pipe when the explosion occurred.

Re-examined by Mr. PAYNE: The gas was burning in the shop at the time, and I was going to light a piece of paper. The explosion did not blow me out into the street. The flash came across my eyes, and then I was in total darkness.

Mr. *John Grant*, examined by Mr. GRANTHAM.

I am an engineer in the employment of the Metropolitan Board. This sewer was being constructed by the defendant, under his contract with them. I was employed to see it done properly. It is not usual to shore up a service-pipe like this. It was firmly imbedded in the earth on each side of the cutting. The sides of the cutting were properly secured. In excavations of this kind it is usual for there to be some small settlement, however carefully things are done. We take every precaution to prevent it. I was not at the spot when the explosion took place. About 20 hours afterwards I examined the connexion of the main with the service-pipe. When I saw it the service-pipe was in a loose state in a broken hole in the main. I could not tell from the appearance whether the connexion had been properly made. The hole in the main when I measured it was 3 inches in length by 1½ in depth, and of an irregular shape. The opinion I formed was that it was an old fracture. I did not notice whether the main was broken in half. I will not undertake to say whether I should have seen it if it had been.

Mr. *T. A. Hedley*, examined by Mr. PAYNE.

I have had great experience with regard to mains and service-pipes. On the 17th of February I examined the pipes in the vicinity of the explosion. The piece of pipe which was handed to me was around the edge for about the eighth of an inch of a dark blue colour, forming a sort of border round the fractured part. The discoloration has been removed now by the action of the atmosphere. My opinion is that the hole in the main for the insertion of the service-pipe had been chipped out and not drilled. My impression is that when the hole was punched the workman cracked the main. Such a crack would not necessarily be discovered at the time. Subsequently some external cause has shaken it, or the frost has loosened the crack. I reported upon it on the 17th.

Mr. HUDDLESTON: Don't tell us what you reported.

Lord Chief Baron POLLOCK: We have nothing to do with your reports.

Examination continued: I made a memorandum at the time that the distance of the main from the edge of the trench was 3 feet. The weight of the superincumbent earth over the service-pipe could not have produced the injury to the main.

Mr. HUDDLESTON: We do not want you to make a speech; just answer the question.

By the JURY: The main could not have been injured by a blow from a rammer, for this portion of it was buried in frozen ground.

By Mr. PAYNE: I examined the main very carefully when it was in the trench and afterwards at the company's office. It was not broken when I saw it in the trench, but when I saw it in the office it was. It is a sound pipe, but it is not a good casting, for the metal is considerably thicker on one side than the other, which would make it more liable to crack when the hole was cut.

Cross-examined by Mr. HUDDLESTON: I have not been employed to get up this case by Mr. Dethick. I have not examined the witnesses nor read their proofs. I have suggested questions to the defendant's counsel during the trial.

Mr. HUDDLESTON: Just like an attorney's clerk?

Witness: Just as Mr. Hawksley did with you. I have been sitting there and doing the best I could to make the jury understand the case.

Mr. HUDDLESTON: I see; just as you are doing now. You do not at all agree with Mr. Hawksley?

Witness: Distinctly not.

Mr. HUDDLESTON: You are diametrically opposed to him?

Witness: Diametrically opposed to him.

Mr. HUDDLESTON: I am not going to ask you about your great experience, but let me ask you where it is you carry on your business?

Witness: At my office, in the Poultry.

Mr. HUDDLESTON: What are the companies you are engineer for?

Witness: I do not know exactly what answer I am to give to that.

Mr. HUDDLESTON: That is just what I want to know. We know Mr. Hawksley, that he is vice-president of the Institution of Civil Engineers.

Witness: I have been engaged as engineer in ten cases in Parliament this session.

Mr. HUDDLESTON: But are you engineer to any company?

Witness: I am a civil engineer in practice, just the same as Mr. Hawksley, only he happens to be connected with the Nottingham Gas Company.

Mr. HUDDLESTON: Let me ask how long were you examining these pipes?

Witness: I made my visit very short—ten minutes; and the reason was——

Mr. HUDDLESTON: Give me the facts first.

Witness: The reason why I did not enter into a more minute examination was that the pipe was not in the same condition that it was when in the trench.

Mr. HUDDLESTON: How long were you examining the pipe in the trench?

Witness: I cannot say; I took as long as was necessary. I cannot say how long to a few minutes.

Mr. HUDDLESTON: Were you more than three minutes?

Witness: Yes.

Mr. HUDDLESTON: Did you try to lift it up?

Witness: I should not be such a fool as that.

Mr. HUDDLESTON: Pray don't try to make me form an estimate of you.

Cross-examination continued: I did not make an attempt to lift it. I got the little piece of pipe produced to-day from Mr. Porter. The fracture all round it appeared to be old. I am certain of it; I wrote it down at the time.

Mr. HUDDLESTON: I don't care what you wrote at the time. Did you think the fracture all round the pipe was an old one?

Witness: I did.

Mr. HUDDLESTON: I suppose you expressed that opinion in the presence of Mr. Porter?

Witness: I did.

Mr. HUDDLESTON: And in the presence of Wren?

Witness: I never saw him before in my life. I wrote at the time——

Mr. HUDDLESTON: I do not care what you wrote. You seem to value it, but I do not.

Re-examined by Mr. PAYNE: I did not notice whether there had been an escape of gas from the service. I believe the crack in the main had been there some time, but the gas had not made its way through it till very recently, owing to the coating that was over it. That coating was disturbed by the frost or by something having shaken the pipe, which broke the

incrustation. When in the trench the main was in one continuous length· I understood, when at the office, that its own weight had broken it.

Mr. HUDDLESTON: Will you venture to say that any one told you that?

Lord Chief Baron POLLOCK: No, we do not want to know that.

Dr. *Letheby*, examined by Mr. GRANTHAM.

I have had a great deal of experience in reference to escapes of gas. It is a very common thing for gas to escape in large quantities throughout London. I have made a calculation, which I think is rather under the mark, that 386 million cubic feet of gas escape every year in London, or about a million feet per day. In the square mile comprising the City of London proper it is about 70,000 or 80,000 cubic feet. My calculation is based upon a leakage of 5 per cent., but I believe, practically, it is 12 per cent.

By the COURT: Gas is a very pernicious thing to breathe when the proportion in the atmosphere is something like 7 or 8 per cent. I refer to this only for the purpose of showing that escapes of gas are very common.

By Mr GRANTHAM: Supposing the fracture spoken of to exist, the contraction of the exposed service-pipe by the action of the frost, which was very severe at that time, would be sufficient to disturb the joint, and allow the gas to escape. Assuming it to be correct, as stated by a witness, that when the ground was opened there was a smell of gas, it is evident that there was an escape, and the action of the frost on the pipe might have the effect of making it worse.

Mr. GRANTHAM: Would the subsequent filling in of the excavation have the same effect?

Lord Chief Baron POLLOCK: Dr. Letheby is an expert in chemistry and sundry other matters, but I should think he knows no more about filling in a trench than you or I do.

Mr. GRANTHAM: What would be the effect of an escape of gas on the pipe through which it escaped?

Witness: Where a pipe is broken, and gas escapes from it into a clayey soil, the cyanogen of the gas would turn the iron blue. But I have looked very carefully at the pipe shown to me, and the traces of it are all gone.

Mr. HUDDLESTON: What contraction do you suppose there would be caused by 20° of cold acting upon a wrought-iron gas-pipe 3 feet long?

Witness: Twenty degrees of cold would produce a contraction of 1/7000th of the length of the pipe.

Mr. *Joseph Peckham*, examined by Mr. PAYNE.

I am a gas-fitter. I saw the main the morning after the explosion, and, in my opinion, the fracture in it was an old one. I noticed from the decayed state of the metal inside, that it was not new. There was an old coating of rust in it. Assuming that the service-pipe was placed across a trench 3 feet wide, and that it was afterwards covered with earth, the weight of that earth and the men treading upon it would not be sufficient to cause such a fracture in the main to which it was connected.

Mr. PAYNE, in a long speech, summed up the evidence for the defence, and

Mr. HUDDLESTON replied upon the whole case.

Lord Chief Baron POLLOCK, in summing up the case, said: Gentlemen of the jury, we have at length come to the end of this somewhat long and intricate case. Mr. Huddleston has remarked that in all probability the contract between the Board of Works and the defendant would indemnify him from all the consequences that might arise. I do not know whether that is so or not.

Mr. HUDDLESTON: On the contrary, my lord, I said that he would have to indemnify the board.

Mr. PAYNE: The contractor is bound to pay all sums of compensation and for all damage arising.

Lord Chief Baron POLLOCK: I do not know, gentlemen, that that ought to have any influence upon your decision after hearing the evidence. The question is, what is the effect of that evidence? One of you, gentlemen, observed, when Mr. James was desirous of the opportunity of reading the evidence, that he might be able to address you, one of you observed that you had all heard it, which is undoubtely of more importance than reading it; and I may here say that I am glad you have called the attention of the City officers and of the public to the state of this court. In my judgment, and according to an experience now by no means very short, it is of as much importance for the jury to see a witness as to hear him. The manner in which a witness delivers his evidence, the calmness, self-possession, and the undisturbed statement of what he has to say, is a considerable voucher for its truth. Whereas, the twisting of the fingers, the uneasy motion of the person, the wriggling of the lower extremities, is a strong indication that the man is telling that which is false, at the same time that he is struggling with some inherent desire to tell the truth, which desire, I believe, is at the bottom of almost every human heart. I have always, in reference to the construction of these boxes for the witness to give evidence in, said, let the table be a narrow one to support the book, but take care that the lower part shall be so arranged as to disclose the whole of the witness's person, that you may see whether he is at rest from the crown of his head to the sole of his foot. If he is not, and you find an uneasiness, a shuffling somewhere, a twisting of the fingers one round another, or the tying up of a pocket handkerchief, you may depend upon it there is something in that uneasiness which the jury ought to see and to exercise their own judgment upon. Before I go into the case, therefore, I say that I think these courts ought to be altered. It is singular enough, that as the witness stood there [pointing to the witness-box], the jury, with the exception of a few persons behind, were the only persons in the court who did not see him at all. The jury, therefore, have not the opportunity of seeing what they ought to see, and it would be far better that the witness-box should be placed opposite to me, and then they would be able to see all that is going on. Gentlemen, we have here a case that particularly would justify the remarks I have been making. It is curious enough that there were just sixteen witnesses on each side. You heard the officers of the company on one side and those who were employed by the contractor with the Board of Works on the other. You heard the scientific witnesses on the one side and the scientific witnesses on the other. You have had some witnesses who proved very little, and a few—three men, I think, called "timber men," who were called for the defendant—and who, as far as I remember, proved nothing at all. There is little for me to tell you in point of law before I proceed to call attention to the case, and, very shortly, to the evidence generally. I think Mr. Payne very accurately stated to you what you were to consider and how you were to consider what is your duty. The plaintiffs—that is, the company—complain that their works have been damaged by the operations of the defendant, who, employed by the Metropolitan Board of Works, was digging a trench in order to put at the bottom of it pipes to carry away the soil, which trench was then filled up. The plaintiffs complain that he did that in such a manner as to damage their works, and Mr. Payne very properly remarked—and it is what you should bear in mind, undoubtedly—that you are to be satisfied—reasonably satisfied—that that complaint is made out and supported by evidence upon which you think you can rely. I do not entirely agree to the proposition of law laid down by Mr. James. It requires to be fettered, to be limited and governed by so many other considerations, that I do not think I shall give you any assistance or render any service to justice if I endeavoured to give you a lecture upon so large and extensive a proposition as is involved in that. Mr. James said if in any way the plaintiffs have contributed to the mischief, then they are not entitled to a verdict. Gentlemen, I cannot lay that down broadly as a proposition. For instance—to take one of the most familiar instances—I think if a man were unhappily on St. Patrick's Day, or on some other day celebrated for feasts and festivities, to feel himself very much inclined to sleep, and were to lie down in the road and there fall asleep, that would not justify any one in riding over him in broad daylight, because a man driving is bound to look before him. Even if he were a drunken man, he would have no right to ride over him. If he did so in the course of the night, or during a total eclipse, for aught I know he might be excused; but in broad daylight if he did so I should say that a drunken man is not out of the protection of the law, but was entitled to that protection, even though he partly contributed to the casualty by his own inebriety. I mention this to show that you cannot lay down the proposition universally. I think what Mr. Payne said was more applicable to the matter. You are to be satisfied—that is, reasonably satisfied—that is, you are to be persuaded that you are doing justice in giving a verdict for the plaintiffs, before you deliver that verdict. Now this case is certainly very remarkable. I own, gentlemen, that I for one rather devoted to science and to those pursuits and studies the tendency of which is to explain all that we see around us;—I own that I heard the strange discrepancies in the evidence with great pain. I am surprised, I am astonished, I am grieved to see men of undoubted respectability, against whom there is apparently no sort of imputation, ranged on the one side and on the other, disputing a fact which I should think to an ordinary mind would admit of no doubt whatever. I cannot conceive of anybody taking up a fractured piece of iron or china without being able to tell, without the smallest doubt or difficulty, "this is an old fracture, that is a recent one; this has been done this morning, that was done some time ago." I think it is humiliating to find, somehow or other, persons arrayed against each other in the way in which we have seen them here to-day—one swearing one thing and the other the direct opposite, there being, as far as I can perceive, no sort of an excuse for the difference which prevails. Probably none of you recollect an occasion, a great many years ago, when Lord Chief Justice Dallas tried a cause between the proprietors of an oil-mill and, I think, the Phœnix Fire Office, which he said was a humiliating day for science. Some of the brightest ornaments of the philosophical world appeared on the one side and others almost equally eminent appeared on the other, and they gave directly opposite testimonies. I recollect some time after meeting Michael Faraday—I may call him by the name by which he will be known to posterity, for he will not be called "Mr.," or "Sir Michael," if it should please the Queen to make him a knight—I remember some years after meeting him, and asking him what was the reason of that difference, for he was on one side, and I believe in consequence of what then occurred he said he would never give evidence again. He said the fact was, that one looked for the *maxima* and the other for the *minima*, and they each found what they looked for. If it were fitting that I should go through the whole of that matter, I could show that Faraday's explanation completely acquitted the gentlemen in question. They were each pursuing opposite experiments, and the one took care that the thermometer should never go down below 60°, and the other took care that it should never go one degree higher than 60°; therefore one got one result, and the other a different result. But that is not the case here. This is the case of eminent, intelligent, respectable persons saying, as they look at the same thing, the one, "There, that is an old fracture;" and the other, taking it up, "That is a new fracture." The one says, "There is all the brightness of new metal about it;" the other says, "There is all the rust of an old fracture." Now, I cannot account for that. The other discrepancy could be accounted for, and when you saw the explanation of Faraday it was intelligible. It very much relieved my mind respecting the perfect honour of those engaged in the inquiry, for their pursuits were different, and the results might very well not be the same. But here, gentlemen looking at the same article come to totally different conclusions about it. For instance, I rather think one of the witnesses for the plaintiff says, "I saw this thing on such a day—it was not at the very time the accident happened—and it was then to my mind perfectly certain that the fracture was a recent one." On the other hand, very respectable persons apparently, on the part of the defendant, say they saw it at the very time, and in their judgment the fracture was an old one. Well, then, gentlemen, this remains in such doubt, that I do not think I shall do much good by reading over the evidence of each of the parties. I must leave it for you in some measure to decide it. There are some other matters pretty much of the same kind. Mr. Porter said very fairly, standing there, "I did not leave the premises till half-past five on the 15th of February—the day when the explosion took place—and I had never, up to the moment of my quitting, perceived any smell of gas." Well, now, what would you conclude from that? Why, that there could be no smell of gas on the premises. He it was whose business it was to be here, there, and everywhere, to go down to see that every thing was right at the bottom of the trench, to be at the corner of this house, and, in fact, in every place where there was business doing, and I conclude from his evidence that he never did smell the gas, or had any knowledge of it at all. And yet there comes, very shortly afterwards—I think it was the witness next but one—Mr. Wren, who says, "I smelt the gas on two days, the 14th and 15th. I did not mention it till the 15th. The gas," I think he said, "was *very* bad; no one could held smelling it. I said it ought to be seen to. By rights, I ought to have seen to it." And then he says he mentioned it to Mr. Porter, not on the 14th, but on the 15th, which, from the evidence of Mr. Porter, one would suppose could not be true And yet I own I was rather surprised that Mr. Porter was not called again to say why, if that was right, he had not taken some notice of it, or that either he or Wren was mistaken, or that he never had such a communication to his recollection. It would have been better to have heard that sort of evidence from one or other of those witnesses. Gentlemen, there is a great deal of contradictory evidence as to what you may call physical possibilities. The plaintiffs case is this:—They say: "The work was doing in our neighbourhood; it exposed a main, and laid perfectly bare a service-pipe; and at that time, and not till then, an explosion took place, which did a great deal of damage, and as to which we complain." They say "We undertake to lay these facts before the jury—our main was broken, the service-pipe was wrenched out, the gas of course would then escape and be led under the house, where there happened to be nothing but a stratum of broken tiles. That caused an explosion, and did us some damage." They do not say "We have suffered a great deal," but "We bring the action to try who was

in the right and who was in the wrong." Their evidence is that it may have been occasioned in various ways—"the mismanagement of a board, in moving it up or down and striking the service-pipe, may have done it; it might have been in various ways; but we believe it happened in this way," and they then state one way. They say: "Our men, when they came to dig up, found that the ground beneath the pipe was soft and not sufficiently rammed;" and they say—it is for you to judge—"that if any weight came upon the soil above and pressed upon the service-pipe it would break away from the main and do the mischief of which we complain." Now, almost every part of this proposition is met and contradicted on the part of the defendant. The defendant says: "In the first place, you are wrong in saying that the soil below was soft and would admit of pressure. It was not so; it was thoroughly rammed;" and then he says there was nothing but 15 or 18 inches of soil above. Still, we did not know until the case for the defendant to day disclosed it that the mode of pressing that soil down was not by rammers but by men standing upon it. To be sure that raised a different question, because whether there were 18 inches upon it or 3 feet might be of no importance with respect to the effect of the weight; but that entirely vanishes when you take a man of 12 or 14 stone weight and put him upon it; for I suppose to tread down a thing of that sort they pick out the heaviest workman—just as you, if you wanted to drive a nail hard, would select the heaviest hammer. Very likely two men would stand together at the same point; at all events, there would be the weight of one man. But they say that would be of no consequence, because the service-pipe, where it was attached to the main, went 3 feet into solid earth. The plaintiffs say that is a mistake. Oddly enough, you have three people who measured it on the one side, and three on the other. On the part of the plaintiff, they distinctly say that the distance between the edge of the trench and the broken main was not more than 15 inches. On the part of the defendant, they say they measured it carefully, and it is 3 feet 2 inches or 3 feet 3 inches. Now, gentlemen, I cannot understand it, and I must leave it entirely for you, for there are hardly two propositions on which the parties agree. They do not even agree upon the plan or model. And the remark which was made at the time was just enough. I think Mr. Porter ought not to have allowed that plan or model to be continually referred to if he meant, when coming into the box, to say that it was not correct. You will remember what his answer was. He was asked: "Did you complain of it?" "I did." "Who to?" "To the attorney." "Did the attorney complain to counsel?" He did not quite know. "Was your complaint ever made public?" "No." So that the whole of yesterday we passed through the inquiry, taking it for granted that the model was correct. Now, gentlemen, I think I have told you that there are exactly 16 witnesses on each side. I do not think I should aid the intelligence of your minds, or advance the interests of justice, if I were to read over the whole of my notes. You heard the evidence, and I think your hearing it and seeing the witnesses was vastly more important than my reading over my notes, even if I took pains to read them in the best possible manner in which evidence can be read. There is a mode of reading it which is of little use. You heard, on the part of the plaintiffs, Mr. David Hunter, who is their superintendent, and to a certain extent, no doubt, an interested person; but you will say whether he did not appear remarkably intelligent and clever. Then you had Mr. Innes, the engineer, and Mr. James Hunter, who is the subordinate of his father, and apparently fills the place of an assistant. You had then Mr. Legge, Mr. Pedder, Mr. Turk, Mr. Gibbons, Mr. Child, an inspector, Mr. Denton, also an inspector, and Mr. Spring. Then comes Cassels, Carter, and Smith, the three men called from the opposite army to say that the work was badly done. Well, I think the remarks made upon those witnesses are true enough. They are persons who are not quite in their right place, and there is no doubt you should hear with a certain degree of suspicion, testimony coming from persons who are discarded servants, and who would naturally come over with a grievance. It is very difficult not to compare it to the case of a well-doing, loyal, high-spirited army, receiving a deserter from the other side. A great deal of care must be taken and you must not implicitly act upon all the communications thus made. Then you have, certainly, three apparently very enlightened persons—Mr. Hawksley, Mr. Carbines, and Mr. Morris. On the other side you have, as I say, exactly the same number of witnesses. You have Mr. Porter, who no doubt is the person responsible; and there was Wren, the ganger, from whom first we learnt that the mode of putting down and pressing the earth was by men standing upon it. You are quite as good judges, and for the purpose of this case far better judges than I can be of the ordinary result of the facts which have been laid before you. I think a great deal of time was wasted by endeavouring to prove as it were that two and two make four. A great deal of evidence was apparently an appeal to science, where there was no science required. Of course, if the service-pipe were embedded in a solid rock, it would not move, but if embedded in ordinary earth—mind, not native earth, but earth which had accumulated, and by the pressure of persons passing over it had become hardened—it would not be so secure. But that is a matter you can judge of for yourselves. A great many questions were put to the witnesses, and this question among others, to my great surprise:—"If the ground below had been perfectly well rammed so as to afford a solid support to the service-pipe, could the service-pipe have been so far affected by any pressure as to produce the mischief complained of?" Gentlemen, it does not want a Sir Isaac Newton to answer a question of that sort. It is obvious that if the pipe be so thoroughly supported that it will not yield to pressure, then pressure will not make it yield. Sometimes you can throw language into a form in which some sense appears it it, when after all it is nonsense—I mean that it is a mere self-evident proposition—what we call an identical proposition. Then, gentlemen, on the part of the defendant three men of the name of Brown, Wren, and Pollen—three timber men—were called, and except that it was in order to make up the number of witnesses to 16, as on the other side, I do not know what they were called for. Not one of them knew anything about it. The substance of their evidence was this—"everything was done that possibly could be done to make the job perfect; what we did we did perfectly, and therefore we conclude that everbody else did." Mr. Hemstead, who was called, certainly offered the gravest contradictions as to the time when the gas was first observed. Then the scientific witnesses, Grant, Hedley, and Perkins, you have heard, and they say, as far as they go, that the fracture was an old one, and therefore the cause assigned by the plaintiff for the accident could not have existed. They say it could not have been done then because the fracture would have been new. Then Dr. Letheby was called, I should say chiefly, perhaps even more so than the timber men, to make the number up to 16. No doubt what he said was very interesting; I thought so. I thought it very curious to be told that a million cubic feet of gas escaped into the atmosphere of London every day, and that in the City proper there were some 70,000 or 80,000 feet thus impregnating the air. Well, I certainly did not imagine that we lived where, as it were, there were so many people around us with bad breath. It is very mortifying to think that there should be such an escape of something which to some extent is poisonous. I do not think that I ever heard anybody say that, to a small extent even, it was beneficial. Those poisons which we habitually take under the name of tobacco and tea, I believe almost all men agree, in certain moderate quantities are very wholesome. I cannot say anything on behalf of tobacco myself, but I could say a very strong word in favour of tea drinking in moderation, and, gentlemen, in behalf of wine, too; but I do not think I ever heard anybody say that although gas is undoubtedly in a certain quantity a deadly poison, and that if mixed with the air you breathe, and breathed long enough, you are quite certain not to breathe any more—I say I never heard anyone say that a little of it was of the slightest use to you in the world. Well, gentlemen, that is the case. If you have the least desire, I will read over the whole of the evidence—it is entirely at your service. I think I have mentioned everything connected with the law of the subject that it is important for you to know, and you are to say whether you think the plaintiff has made out to your reasonable satisfaction that he is entitled to your verdict. If he is, your verdict is to be for £5. 5s.; if he is not, your verdict will be for the defendant.

Mr. PAYNE: Your lordship has passed over the evidence of Poole and Spurgeon.

Lord Chief Baron POLLOCK: You are quite right—I did pass over Poole and Spurgeon. They say that the work was all right. These are the persons who were said by the three discharged men to have complained about it. I observed that one of those gentlemen—I think it was Poole, who was first called—said, "I did find fault; I found fault with everything; it is the way to get work well done. The more you find fault the better it is done." The probability, therefore, is that the witness was right, that he did find fault. He said, "If I did find fault, it was because I always do. You must not infer that the work was bad because I did find fault—it keeps the men up to the mark."

The jury proceeded to consider their verdict. After the lapse of ten minutes, they handed up a paper to the judge.

Lord Chief Baron POLLOCK: The jury ask if the question they have to decide is not this—whether the defendant was the cause of the mischief. Certainly it is. It is stated very generally in the declaration. It is not necessary that the mischief should have been done in the precise way deposed to by the witnesses; but that is the question generally.

The jury again consulted, and in a few minutes announced that they had found a verdict for the defendant.

Verdict for the defendant.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

MEETING OF GAS CONSUMERS AT GUILDHALL.

A Public Meeting, convened by the Lord Mayor, was held in the council chamber of the Guildhall of the City of London, on Monday, the 3rd inst., for the purpose of considering what steps should be taken to secure a reduction in the price of gas from 4s. 6d. to 2s. 9d. per 1000 feet, and to consider the propriety of petitioning Parliament for the repeal of the Metropolis Gas Act of 1860, which deprived the public of competition.

The meeting, at the commencement, was rather thinly attended; but towards the close the numbers increased, and at the conclusion there were about 100 persons present.

The Right Honourable the LORD MAYOR presided; and, in opening the proceedings, said he had called the meeting in consequence of a requisition signed by an influential body of citizens and large consumers of gas, for the purpose of expressing their opinion regarding the present supply of gas in London. Were it not for the compliance of the corporation, the Act of 1860 would never have passed; and had it not been that they were promised that the price of gas should be reduced, that Act would not have had their support. Since that time, great improvements had been made in the manufacture of gas, and it could now be made much cheaper; and what was the result? Instead of having benefited the consumers, the companies had united together and had only reduced the price 6d. per 1000 feet. At Liverpool, gas was sold at 3s. 6d. per 1000 feet which was equal to 18 sperm candles in illuminating power, and far superior to that supplied in the City of London. He thought the citizens had good reasons for complaint; and he had considerable pleasure in granting the use of the Guildhall for the purposes of a meeting at which some resolutions might be made to take steps to get a remedy of the great grievance of which they so justly complained.

Mr. G. FLINTOFF said he had been called upon to address the meeting on behalf of a very large and influential body of gentlemen, who had presented a requisition to the Lord Mayor, asking him to call that meeting. That requisition was signed by more than 500 gas consumers of the City, and they called for inquiry into the question of manufacturing and supplying gas. His object in coming forward that day was not so much to say anything about the existing companies as to state the facts which had to do with the manufacture and distribution of gas in the City. He at once avowed himself to be the engineer of the Gas Consumers Association, and he said the meeting ought to understand that it was with no philanthropic feeling that any movement was made in the matter. They wanted free trade in gas as in everything else; and if it could be shown that London could be supplied as cheaply as other towns, he maintained that it ought to have it. What had been secured to other towns could, he was sure, be secured for the City of London. It had been his lot to overthrow 173 of these monopolies, and in every instance the companies tried to make it appear that they were selling their gas at a fair and reasonable rate; but from the dread of competition, or from other causes, in these 173 towns in England, Ireland, and Scotland, the companies had been compelled to lower their prices, the effect of which reduction was a saving of £600,000 to the consumers. But notwithstanding that reduction, there was not a single case in the 173 towns where the company's dividends had been reduced. Why, then, did they oppose reduction? For the simple reason that the managers, promoters, and directors of gas companies did not understand the political economy of their own trade, but were as infants in their business, and required to be taught in respect of gas the same principles which had been taught to other persons respecting other commodities of a commercial nature. In 1848 a great cry was raised for cheaper and better gas; and the then alderman of Farringdon Without convened a meeting, which he remembered was held in the Old Bailey, and at which the idea was promulgated to supply gas at a cheaper rate; and the effect of the meeting was the formation of the Great Central Company, which no doubt reduced the price of gas from 6s. to 4s. per 1000 feet; but from that day to the present London had stood still. She had not

moved one iota in the shape of obtaining gas of a better quality or at a cheaper rate. While London had stood still, the gas consumers in the provinces had been up and doing, and reductions had taken place. According to parliamentary returns, which any one could obtain for themselves, it seemed that in provincial towns they had secured the reduction of 32½ per cent., whilst in the City they had only secured a reduction of 12 per cent. If London had only been awake to its own interests, as it ought to have been, the inhabitants would have secured the same reduction as had taken place in Manchester, Liverpool, and other towns; but in consequence of the citizens of London having been deluded by the promoters of the Great Central Gas Company, and having placed too much faith in them, they had been thrown back, and instead of being in a better position, as he should show them they ought to be, than any other town, they had a worse supply of gas than any other part of Great Britain—instead of having the very best gas at the lowest possible rate they had the worst gas at the highest rate—and all this had arisen entirely because the citizens had put too much confidence in these would-be philanthropists, who pretended they were going to do so much, but actually did nothing but what tended to their own aggrandisement. The proprietors of that company told the Court of Sewers that they would reduce the price of gas first to 4s., then to 3s. 6d., and finally to 3s.; and he saw from their own accounts, published that day, that they had arrived at the maximum consumption which they then stated would enable them to make that reduction. But instead of selling gas at 3s. per 1000 feet, they were now charging 4s. 6d. for it. He thought, therefore, that the citizens had a right to turn round, and say, "You have broken faith with us in this matter," because the Commissioners of Sewers supported them on the promises they made. They opened the streets, and kept away others who no doubt would have come in to do the same thing; and although they brought about a reduction at the time, the company were not in reality to be thanked for it, and he denounced it as a "job" from beginning to end. The company, instead of being a gas consumers company, had become a Charles Pearson's company. They raised the necessary capital, and Mr. Croll entered into a contract with them to supply gas at 1s. 9d. per 1000 feet, out of which 6d. per 1000, he said, would be profit. Half of that was assigned to Mr. Charles Pearson and his heirs for ever, in consideration of his services in the formation of the company. It turned out afterwards that the profits received by that gentleman amounted to between £6000 and £7000 as his share in the manufacture of gas for the supply of the City. In the City of London gas could be supplied much cheaper than in any other town in the world, on account of the great consumption over a very compact area. For instance, they had in the City 75 miles of gas-pipes, conveying 1,087,000,000 feet of gas; and in consequence of that compactness it could be distributed at a much cheaper rate in this City than in any other districts where the area was more scattered; for if they could sell £1000 worth of gas in one mile while in other districts it took an area of four miles to convey the same quantity, it was plain that the cost of distribution in the former instance was much less than in the letter. So far, then, as the compactness of the area went, London ought plainly to be supplied at the cheapest possible rate. He was then going to show them what the price of gas should be, and he would base his data upon his experience of the 173 towns he had already alluded to, and he should be delighted if any one could overturn his truths or his figures. Gas was supplied at Plymouth at 2s. 9d. per 1000 feet, and it would be supplied in London at the same price; if it were not, it was because of mismanagement, or extravagance, or some other causes, which might be avoided if the gas companies thought fit. He should then show them what the effect would be if the same plan were adopted in London as that which has been adopted in Manchester, by placing the supply of gas in the hands of the local authorities, and appropriating the profits to the reduction of the taxes upon the inhabitants. The price of gas at Whitehaven was 2s. per 1000 feet; Bradford, 3s. 4d. to 2s. 4d.; Newcastle, 3s.; Walsall, 2s. 8d. to 2s. 4d.; Gateshead, 3s.; Cardiff, 3s. 3d.; Nottingham, 3s.; Liverpool, where cannel gas was supplied, 3s. 2d.; Birmingham, 2s. 7d. to 3s.; South London, 3s. 8d.; Manchester, cannel gas, 3s. 1d. to 3s. 2d.; Whitehaven, 1s. 5d., contract price; Plymouth, 2s. 9d.; London, 4s. 6d.; and Maidstone, 4s. Now a ton of coals yielded 9400 feet of gas, 10 gallons of tar, 10 gallons of ammonia water, and 13 cwt. of coke. But where coals were dear coke was dear also. Coals could be had in London for 14s. 3d. a ton, and coke sold at London at 11s. a chaldron after giving 9400 feet of gas, and the cost of production would only be 6d. per 1000 feet in London more than at Newcastle; and, taking into account the facts he had mentioned as to the compactness of the area, it did appear to him remarkable, and an anomaly, that the citizens should have so long submitted to the payment of 4s. 6d. per 1000 feet for their gas. Evidently a great wrong and a great injustice was being done them, and the sooner they obtained redress the better. Then let them take the case of Plymouth, which was a more parallel case than Newcastle. At Plymouth, the price of gas was 2s. 9d. per 1000, although at the time the agitation was started in 1848 it was 6s. per 1000, but the price had gradually fallen step by step to 2s. 9d. But London stood still up to the year 1860, and the price continued at 4s., but as soon as an opportunity was offered to the proprietors of the Great Central and the other companies they took advantage of it, and instead of carrying out their promise to lower the price, they increased it to 4s. 6d., about which it had stood ever since. The result of the reduction at Plymouth must be regarded as the result of good management, and the increase in London to jobbery and mismanagement. Then let them go to Whitehaven. There a gas consumers company was started, and they started to sell it at 2s. 6d. per 1000 feet, the price then being 4s. They no sooner did this than the old company lowered its price to 2s., and ever since the formation of the new company, in 1853, gas had been sold at 2s. a 1000, and a dividend of 2½ per cent. had been realized by the old company, and a dividend of about the same amount had also been obtained by the new company. So it had been proved that gas could be manufactured and delivered for 1s. 5d. per 1000, with an illuminating power of 12 candles. This was because the manufacture of gas was as simple and unchanging a process, and as unvarying as the turning of malt into beer, or tallow into candles. In Manchester gas was sold by the corporation at 2s. 8d. per 1000 feet, and the profits last year derived from the sale amounted to £59,000 in round numbers, and out of that amount £28,000 was applied to the purposes of public improvements. What had been done in Manchester could be done in London. He had no hesitation in telling them that they could not only get gas at 2s. 9d. per 1000, but could make as much profits as would light all the public lamps of the City for nothing. That, he said, was the legitimate purpose of the corporation. At Liverpool gas was sold at 3s. 2d. per 1000. Coke sold at Liverpool at 6s. 8d., but in London for 11s., whilst in Manchester it only sold for 5s.; and yet Manchester got gas for 2s. 9d., and made the large profits he had referred to. Was not this subject, therefore, worth inquiry—was it not worthy the attention of the citizens of London? But it was a question that not only concerned them as citizens, for a great number of those who transacted business in the City by day slept out of the City by night, and the question affected, therefore, the suburbs of London as well. It was a curious fact, that whilst eight gas companies of the metropolis had reduced the price, the City companies had remained stubborn. In the City they had not only paid 10 per cent. dividend upon their current shares, but they had paid back dividends, and also 4½ per cent. to pay off arrears, making 19 per cent per annum. In addition, they paid £4750 to pay off the expenses of the Wood Street explosion; for if the company were to blow up a whole street, through their own fault and carelessness, it would not cost them a shilling—the whole expense was charged on the consumers of gas. They paid £10,673 to the engineer, and that showed them what could be done in London. The companies in the City had paid in law expenses £38,212. 2s. 6d. The speaker then turned to the testings made by Dr. Letheby in the City, and expressed his opinion that the taking those testings was a complete farce, and he said in order for them to be accurate they should be taken during every hour of the day and night. Since the Metropolis Gas Act had been passed a new sort of burner had been used, which gave an advantage of 2 per cent. to the companies, making 10-candle gas actually used as 12 candles. If they wanted cheap gas the matter must be taken up by the City authorities. One-third of the gas was lost in its distribution. In Dublin, with coals at 12s. 6d., gas had been sold at 1s. 4¾d. By placing the supply of gas in the hands of the corporation the citizens would be saved half the present cost.

Mr. TRIPP moved—"That the supply of gas ought to be placed in the hands of the local authorities, so that after lighting the public lamps the private consumer ought to obtain gas at cost prices."

Dr. O'BRYAN seconded the motion. He said that a great advantage would arise to the consumers if cannel gas was made, and that a company could supply such gas at 4s. 6d. per 1000 and realize a profit of between 13 and 15 per cent.

Mr. E. DRESSER ROGERS said he was exceedingly glad that that meeting had been held; but he thought that some of the many influential gentlemen who had signed the requisition to the Lord Mayor asking him to call that meeting ought to have been present at the occasion, and have expressed their opinion upon such an important question. But he rose principally for the purpose of informing those gentlemen who were not aware of the fact, that the corporation of London were alive to the importance of the subject; and at a meeting held on the previous Thursday they had unanimously decided that they would themselves apply to Parliament for powers to undertake the manufacture and supply of gas to the citizens. So far as they were concerned, therefore, the work was done. He might also say that when the corporation decided upon doing anything it was not often they changed their minds, or of doing one thing to-day and another to-morrow. They were, he thought he might say, perfectly qualified to carry out such a work without calling for any assistance in the way of money from those residing in the metropolis. Mr. Flintoff had openly announced himself a paid agent of the London Gas Consumers Association; but he (Mr. Rogers) thought it ought to be mentioned to the meeting that in the City of London a gas consumers association had been formed, and had been actually engaged in raising an enthusiasm throughout the City in reference to this important question, without calling upon the citizens for a single sixpence. He could not help thinking that the meeting that day of citizens and delegates from the metropolitan parishes ought not to have been left in the hands of Mr. Flintoff, or of the London Gas Consumers Association, on behalf of which he was engaged; but that some of the gentlemen connected with eminent firms in the City and elsewhere, who had signed, should have come forward with some resolution.

A PERSON from Chelsea understood that that was not merely a meeting of the citizens of London, but was convened in order that an expression of feeling might be obtained on the part of the inhabitants of the whole of the metropolis.

Mr. W. ADAMS DAVY hoped the City of London did not intend to throw the inhabitants of the metropolis overboard in this matter. He was glad to find the City had roused itself to the importance of the question, and were about to proceed to Parliament respecting it; but he said they, as representatives of the metropolis, came there that day to ask the great City of London to lend them their aid and support in obtaining a repeal of that Metropolis Gas Act, which had operated so detrimentally to their interests. In the district in which he lived they paid 25 per cent. more for their gas than they did in the City, and had much worse gas, the supply being by the Western Gaslight Company. But he would tell the meeting how the tradesmen of the district were served by the company. Notwithstanding the high price charged for the gas, they also charged them 10s. for each light in every house, so that a person having 20 lights would have to pay £10 to the company. That sum was held by the company in their hands, and unless it was paid by the consumer he had no light. The company in that way had had £20,000 in their hands for ten years without giving a single farthing interest for the money they had been using. He had no desire to say anything against the resolution come by the Court of Common Council, but he said that as they had decided to apply to Parliament for a bill to take the manufacture and supply of gas into their own hands, he hoped they would not turn round on the metropolitan inhabitants and leave them to fight their battle for themselves, and not give them assistance.

The Lord Mayor, at about this part of the proceedings, was compelled to leave the meeting, and Mr. Haines, a member of the Common Council, and chairman to the committee appointed by the Civic body to take the question of the gas supply into consideration, was voted to the chair.

Mr. E. DRESSER ROGERS disclaimed any intention of causing any disunion at that meeting. He asked the delegates for the metropolitan parishes to express their opinion upon the question, but he thought the first step was to pass a resolution in support of the corporation in taking steps for parliamentary powers to undertake the supply of gas, and afterwards they could pass any other resolution they pleased.

Mr. W. PAYNE coincided with the opinion expressed by Mr. Rogers. He said the only way to get a remedy in this matter was from the citizens and inhabitants of the metropolis to apply to Parliament for power to make their own gas.

Mr. J. R. HOPE, of Bayswater, said the inhabitants of the metropolis did not desire to take out of the hands of the Common Council what they were about to do, but they attended that meeting to state their grievances. What they wanted was that the City of London should give them their assistance in extinguishing the giant monopoly which existed in reference to the supply of gas all over London. The only way he thought to do that was to get rid of the Metropolis Gas Act of 1860 by applying to Parliament to order that it should be repealed, and he trusted that a resolution would be passed to that effect.

Mr. HOOKER said that the objections made to the gas supply did not come from one part of London alone, but everywhere there was a spontaneous expression of opinion in condemnation of the present supply.

Mr. J. G. WENBORN thought this question was now ripe for further agitation, and he urged the gentlemen present that as a general election was about to take place, a most favourable opportunity was presented for putting ques-

tions to the several candidates for the representation of the several metropolitan boroughs, as to whether they would or would not support in Parliament a bill for the repeal of the Metropolis Gas Act of 1860. He might say that in the borough of Finsbury, of which he was an elector, such questions had been put to the candidates, and from the answers they had received they had determined upon supporting the candidates.

Mr. J. MEDWIN, alluding to the decision recently come to by the corporation in favour of an application to Parliament for power to lay down mains, and supply the citizens with gas, observed that that body had control over their streets and roads, and he advised the meeting to consent to adopt the suggestion of Mr. Rogers in the first instance, and afterwards a resolution could be passed in favour of an application to Parliament for a repeal of the Metropolis Gas Act, to which he quite agreed. He also observed that the members of the Common Council were interested in the several districts in which they resided out of the City, and could have, therefore, no idea nor intention of overthrowing or opposing any steps which might be taken by the metropolitan ratepayers in any steps they might take to get a redress of the grievances of which they so justly complained.

After some discussion relative to the form of the resolution to be proposed, the original proposition was put and carried.

A resolution was then moved, that steps should be taken to obtain a repeal of the Metropolis Gas Act, 1860, which was also agreed to.

Mr. DRESSER ROGERS then moved—"That this meeting of gas consumers is of opinion that the corporation of London should be supported in their determination to apply to Parliament for power to supply and manufacture gas for the City." In doing so, he begged to call the attention of the meeting to a journal, in the interest of the gas companies, called the JOURNAL OF GAS LIGHTING, which contained a most accurate report of his speech at the Court of Common Council, in proposing the resolution that the corporation should apply for parliamentary power to take the manufacture and supply of gas into their own hands, and that journal had also done him the honour to comment in an editorial article, upon the remarks he then made. But he found in that journal, from advertisements and other information, that the statements made by Mr. Flintoff, of whom he would say he had never seen nor heard him speak before that day, both with respect to the price of coals, the amount of gas that could be produced, and also the large dividends which the gas companies realized from the sale of gas, were correct. He took it to be most extraordinary that the companies should in their own journal furnish such a strong case in support of the assertions made by the gas consumers, who complained so loudly of the injustice now being done to them. In the first part of their remarks, they said that they "had on several occasion advised the City gas companies to deal liberally with the public, while maintaining their legal right, and to attend in due time to the signs of discontent exhibited in various directions." Among several other matters, too, he found a long report of the proceedings of the Common Council in reference to this question, and then a report of the Court of Sewers, at which Dr. Letheby's report upon the illuminating powers and chemical quality of the gas was read. He then came to an elaborate lecture by Dr. Letheby, on the manufacture of gas, in which he showed, upon evidence not to be controverted, the deleterious character of much of the gas supplied to the consumers. Altogether the statements confirmed in very many important particulars the statements with regard to high price and bad quality of the gas supplied in the City.

Mr. ARMSTRONG, of Chelsea, seconded the resolution, which was put and carried.

The proceedings closed with a vote of thanks to the chairman.

MALTA AND MEDITERRANEAN GAS COMPANY, LIMITED.

An Extraordinary General Meeting of this Company was held at the London Tavern, Bishopsgate Street, on Wednesday, June 28—EDWARD HAWKINS, jun., Esq., in the chair.

The notice convening the meeting having been taken as read,

The CHAIRMAN said the directors had circulated among the shareholders a copy of the engineer's report as to the state of the three stations, and a balance-sheet of the accounts of the company for the 12 months ended the 31st of March last. It would not, therefore, now be necessary to read those documents, but he would ask the secretary to read a brief report from the board.

Mr. E. P. ROWSELL, the secretary, accordingly read the following report:—

On the present occasion, the directors deviate somewhat from their usual form of report. The company's engineer, Mr. Hodgson Jones, having recently inspected the stations both at Malta and Corfu, and having furnished thereon an elaborate report, the directors preferred, instead of embodying such report in their own, that it should be printed *in extenso*, and circulated amongst the proprietors, which has been done.

The directors are pleased in being able to point to the entirely satisfactory character of the report in question. At the last meeting the directors were empowered to issue debentures to the extent of £30,000, at interest not exceeding 6 per cent. per annum. Of this amount only £4900 has been so obtained; and the directors are now advised to give the option of another class of security—viz., preference shares, at 7 per cent. per annum, with power to the holder to convert into ordinary shares at any time prior to the 31st of March, 1868. Resolutions authorizing the directors accordingly to issue 6000 preference shares of £5 each will be submitted to the meeting. The shares will, in the first instance, as required by the Articles of Association, be allotted to the shareholders rateably to their present holding. The sum of £1 per share will have to be paid immediately. No call will be made without an interval of three months since the last call. Calls may, however, be paid in full, interest at 5 per cent. per annum being allowed for the advance. The resolution thus to increase the capital requires the consent of the holders of the deferred shares; and as to the condition of their acquiescence, those parties require a modification of the terms upon which such shares are held. A resolution will accordingly be submitted to the meeting, cancelling clause 116 of the Articles of Association, and substituting a clause embodying the fresh terms proposed to be made relative to these shares.

It will be observed in the accounts that the profit made last year represented, within a small amount, the entire sum needed to pay dividend at 7 per cent. per annum on £30,000, and this with scarcely any help from No. 2 station, and none whatever from No. 3. As in this year the earnings of all three stations will come into account, there can be no question of the perfect eligibility of these preference shares as an investment.

From the profits of the past year, the directors recommend a dividend at the rate of 2½ per cent., free of income-tax, which will allow of the reserve-fund being increased to £500, and a balance of about £60 being carried to the new account.

This being an extraordinary meeting, the several resolutions, together with the resolutions usually proposed at an ordinary meeting (the whole having been set forth in the notice) will need to be confirmed at a second extraordinary meeting to be summoned for that purpose; and it is intended that such second meeting shall be held on Friday, the 14th of July next.

Balance-Sheet, March 31, 1865.

Dr.			*Cr.*		
To Capital—			By Preliminary expenses		£1,614 14 3
9200 ordinary shares of £5 each	£46,000 0 0		Outlay—		
Less arrears—sixth call	15 0 0		No. 1 station	£26,339 14 7	
	45,985 0 0		No. 2 ,,	21,624 14 2	
2800 shares under special conditions, £5 each	14,000 0 0		No. 3 ,,	13,924 18 8	
		£59,985 0 0			61,889 7 5
Loans		10,200 0 0	Relaying and rearranging mains		2,353 8 8
,, on debentures		2,000 0 0	New retort-house		2,603 4 10
Bills payable		6,327 8 10	Relaying services, No. 1 station		744 7 7
Sundry creditors		8,359 12 9	Services, 1 and 2 stations		2,831 3 3
Reserve-fund		391 17 10	,, No. 3 station		36 7 6
Profit and loss (as below)		1,337 6 1	Sundry works		304 14 3
			Loss by oil lighting at Corfu		234 18 6
			Incidental expenses at Corfu		15 6 2
			Suspense accounts (minor questions with the vendors, and of account with the stations)		739 14 10
			Furniture (London office)		42 77 6
			Sundry debtors (Malta and Corfu)		3,438 8 7
			Stocks (coal, fittings, and general stock at the three stations)		12,652 12 2
		£89,501 5 6			£89,501 5 6

Profit and Loss Account, March 31, 1865.

Dr.	Station No. 1. Valetta.	Station No. 2. Calcara.		*Cr.*	Station No. 1. Valetta.	Station No. 2. Calcara.	
To Coal	£2,224 10 2	£377 13 11		By Gaslight	£5,849 17 11	£730 16 5	
Gas making—wages	540 12 9	165 12 6		Products	739 16 6	72 11 3	
Gaslights—salaries	196 19 8	57 10 0		Rental of meters	68 17 1	75 1 6	
Street-lights	196 18 8	—		Stock	16 5 8	5 9 5	
Lime, purifying materials	36 9 11	0 3 3		Rents	71 10 4	—	
Wear and tear	88 2 7	19 5 9			£6,746 7 6	£883 18 7	
General expenses	303 15 3	79 14 10					£7,630 6 1
	£4,187 9 0	£700 0 3		Profit on fittings			325 13 4
			£4,887 9 3	Transfer fees			1 11 6
Exchange account			10 9 3	Amount to the credit of disputed accounts fund			30 7 4
London expenses		£952 16 10					
Less carried to capital account, Corfu		200 0 0					
			752 16 10				
Interest on debentures			106 11 0				
,, and discounts			893 5 10				
Balance (for reserve and dividend funds)			1,337 6 1				
			£7,987 18 3				£7,987 18 3
				By balance brought down			£1,337 6 1

The CHAIRMAN then moved—"That the balance-sheet for the year ended 31st March, 1865, as presented to this meeting, and the report of the directors, be approved and adopted."

Mr. SLOUS inquired whether the directors had received a protest from certain proprietors against the mode of dealing with the capital of the company which was proposed in the report. If so, he desired that it might be read.

The CHAIRMAN said he had received such a protest, and was prepared to lay it before the meeting. The shareholders were fully aware of the circumstances under which Messrs. Nicol and Duckworth held certain shares in the undertaking, which shares were taken in part payment of the purchase-money for the works and premises at Malta. The dividends upon those shares were, according to the Articles of Association, deferred for a given period, but it was now proposed that they should be placed upon a par with the ordinary shares from and after next March. The directors were themselves opposed to the plan at first, but they found it had become a matter of necessity, it being the condition which the holders of those shares required for their consent to the issue of preference capital. At present the company owed a large sum of money, a portion of which had been raised upon the personal security of the directors. It was quite impossible that they should go on in that way. Personal security as a temporary arrangement was all very well, but in the course of a few months the directors would be called upon to pay back the money so borrowed. They would thus become the principal creditors of the company, a state of things which was not at all desirable. The only way that appeared open to them as likely to meet the exigencies of the case was to raise further capital by the issue of preference shares, and to do that they required the consent of Messrs. Nicol and Duckworth, who, as he had stated, made this the condition of the bargain. The letter which he had received from Mr. Dodgson stated that that gentleman, having taken his shares on the stipulation that the vendors shares would not be taking dividend until three

years after the first payment of dividend to the ordinary shareholders, he decidedly protested against the proposal in the circular convening the present meeting, whereby the said vendors shares were to rank *pari passu* with the ordinary shares of the company after the 31st of March, 1866. Mr. Dodgson said he could only conceive of such a proposition as an act of repudiation, and he requested that this protest might be read to the meeting and duly recorded. Now his (the chairman's) first impression on the matter was decidedly in favour of the view taken by the writer of the letter, but, on carefully considering the position of the company, it seemed to him that no other course was open to them. They must offer some inducement to persons to take the new shares, and for the sake of doing so they must accept the conditions upon which those shares alone could be issued.

Mr. RHODES said he strongly objected to the creation of £30,000 worth of shares with a perpetual preference dividend of 7 per cent. He thought it would be much better for the future as well as the present interest of the company to raise the necessary funds by the issue of debenture bonds.

The CHAIRMAN said the board had been very anxious to do so, but although they had the authority of the proprietors, at the last annual meeting, to issue £30,000 of debentures, they had only succeeded in raising £4900 in that way. The company must have the money, and the question now was, in what other form they could raise it. Their prospects, as regarded the working of the stations, were very favourable. The orders which they had received for laying on gas from the Calcara works justified the belief that that station would ultimately be as profitable as the station at Valetta.

Mr. RHODES said if application had been made to him, he would have taken up another £1000 worth of bonds at the time they were issued. He thought the directors might yet raise £10,000 in that way.

The CHAIRMAN said he wished they could. For himself, he would say that for every £10,000 so raised he would take up £1000. For the money they now proposed to obtain the company could give admirable security, as the works were improving every day. In the next year and a half their business would probably be doubled.

Mr. HODGSON JONES, in reply to the chairman, said he had already stated in his report that as regarded No 1 station (Valetta), there was, in his opinion, a great deal of business yet to be obtained. With reference to station No. 2 (Calcara), the company had now orders for fittings to the extent of nearly double the present rental. The military and naval establishments would be very large consumers, and he believed that the public lighting from No 2 station would be as productive as that from No. 1.

The CHAIRMAN said both the military and naval authorities were prepared to light the barracks and other public establishments, and there was no doubt that during the next year the company would have a very large rental. And it must be remembered that the increase of the rental would yield a profit more in proportion than they had hitherto obtained, because all the establishment expenses were borne by the present revenue. Mr. Hodgson Jones had carefully inspected the works at Corfu, which it was feared last year would prove a drawback to the company. It was gratifying to know that that station had not been so, and that Mr. Hodgson Jones anticipated it would during this, its first year, earn 3 per cent. upon the capital expended there.

Mr. SLOUS said he quite concurred in the mode proposed for raising the additional capital. He believed it was better to raise it by preference shares, with the option of conversion, than by debentures, and he believed that when the time came the holders of such shares would be quite willing to convert them into the common stock. Still they must come back to the question he had already mooted, viz., whether they were doing right in altering the position of the shareholders in reference to the deferred shares. He did not think the holders of the deferred shares ought to make a claim upon the necessities of the company; and unless the directors could show to the proprietors at large that there was no other mode of overcoming their difficulties, they ought not to sacrifice the interests of the ordinary shareholders in that way.

The CHAIRMAN said the capital of the company originally was too small. It was calculated at first that £60,000 only would be needed, but much more than that had been expended. The proprietors must recollect that by issuing preference shares, Messrs. Nicol and Duckworth were placed in a different position to that in which they stood when the purchase was made from them.

Mr. NICOL, M.P., said when he and Mr. Duckworth sold the works to the company they were confined to the Valetta station, and if the company had not extended their operations to Calcara and Corfu they would have been able from that day to this to pay within a fraction of 6 per cent. The necessities of the company, however, required the extensions referred to, and he, as one of the directors, concurred in the policy of the board. But the consequence was, that further capital was imperatively needed, and the vendors willingly fell in with the proposal to borrow money upon debenture bonds at 6 per cent., although by so doing they still further delayed the payment of dividends upon the deferred shares. Having, however, failed in that, and it now becoming necessary to raise capital upon other terms, they felt that they had a right to consider their position. If preference shares were created for the purpose of paying the debts of the company, of course they would take priority of dividend to all other capital, and it was only right that the vendors should require some limit to the time beyond which the dividend on the shares which they took in part payment of the purchase should not be deferred. The company had now been in operation four years, and it would be two years more under ordinary circumstances before any dividend could come to them. It was not, therefore, unreasonable for them to require that as they had been out of their money for six years, they should then be placed upon the same footing as the ordinary shareholders.

Mr. RHODES inquired the meaning of the item in the balance-sheet "Loss by oil lighting at Corfu."

Mr. HODGSON JONES said it referred to the contract which had to be entered into with the municipality of Corfu, to light the town with oil until the gas was laid on.

The CHAIRMAN said Corfu was lighted with oil at the time the company took the contract, and they were required to continue that lighting till they were prepared to substitute gas. The price of oil subsequently rose considerably, and this loss was thus occasioned. In answer to a further question, he stated that the amount on the debtor side of the balance-sheet, £15, under the head of "less arrears—6th call" had been paid.

Mr HODGSON JONES, replying to an inquiry, said gas-fitters had been sent out from England, but during the last six months he had organized a staff of Maltese fitters.

The motion for the adoption of the report and accounts was then put and carried unanimously.

Some conversation took place upon a suggestion by a shareholder as to the holding of half-yearly meetings, and the chairman promised that the subject should receive the attention of the directors.

It was then resolved that a dividend at the rate of 2½ per cent., free of income-tax, be paid on the ordinary shares of the company.

Messrs. Crosley and Lysley were re-elected directors, and Mr. Backler and Mr. Daniell auditors of the company; the remuneration to the last-named gentlemen being fixed at twenty guineas each for the past audit.

On the motion, on the CHAIRMAN it was resolved unanimously—"That the clause 116 of the Articles of Association be, and the same is hereby, cancelled, and the following substituted:—Subject to the proviso hereinafter mentioned, all dividends shall be upon the capital of the company rateable according to the amount paid up, or credited as paid up, on the shares into which the same is divided. And, in apportioning such dividend, it shall be competent to the directors (unless otherwise instructed by a general meeting) to take into account the respective times at which the payments upon such shares shall have been made. Provided always, and it is expressly agreed that the shares issued, or to be issued, to the said William Nicol and Robinson Duckworth, in part payment of the purchase-money for the said works and premises, shall not participate in the dividend now declared, or about to be declared, nor in any dividend arising out of the profits of the year ending 31st March, 1866, but from that time forth the said shares shall, in regard to dividend, and in all other respects, rank *pari passu* with the ordinary shares of the company."

The CHAIRMAN moved, and Mr. CROSLEY seconded, the following resolution, which was also unanimously adopted—"That, in pursuance of the recommendation of the directors, the capital of the company be increased from £60,000 to £90,000."

On the motion of the CHAIRMAN, seconded by Mr. NICOL, M.P., it was resolved, *nem. con.*—"That the increased additional capital of £30,000 shall be raised by issuing 6000 shares of £5 each, the holders whereof shall be entitled from time to time, out of the net revenue of the company for each separate year, but without having recourse to the revenue of any subsequent year, to a perpetual dividend of £7 per cent. per annum on the amount paid up in respect of such new shares, in priority of the dividend on any other portion of the capital of the company. And, further, that the holder of the said shares shall have the privilege, at any time prior to the 31st March, 1868, of exchanging the same for ordinary shares of the company." Also—"That the directors may make calls in respect of such new shares as they may think fit;" and—"That clause 40 of the Articles of Association be altered by expunging the word 'May' and inserting in its place the word 'June.'"

Votes of thanks to the chairman, directors, and auditors were then adopted, and the special meeting for the confirmation of the foregoing resolutions having been fixed for two o'clock P.M., on Friday, the 14th of July, at the offices of the company, the proceedings terminated.

LIGHTING BOMBAY WITH GAS.—The Bombay Gas-Works have been now opened, and the inauguration has been such as to give them the necessary *éclat* among a population to which gas is a thing unknown, save by name. The works were brilliantly illuminated for a week, and during the first night of the illumination the European and native gentry of the town, to the number of about 500, were entertained at a very sumptuous banquet, provided by the company. His Excellency the Governor of Bombay was to have presided, but in his absence from Bombay, and at his suggestion, R. B. Barton, Esq., first acting magistrate of police, fulfilled the duties of chairman. The new illuminator seems to strike the native inhabitants with surprise; they have difficulty in understanding how anything should burn without oil, but there is ample reason to believe that they will not be averse to introducing gas into their houses. There could not be fewer than a thousand people at the gas-works on the first night of the illumination, and the works were visited by large numbers during the remainder of the inauguration week. One night was set apart exclusively to enable the native ladies to visit the works, and it is not the least gratifying that this was done at the suggestion of the native gentlemen themselves. The mains are extensively laid in the native town and in the fort, and a further supply of mains, together with a supply of gas coal, have arrived in Bombay within the last two days. The additional supply of piping will put the fort into connexion with the works.—*Bombay Gazette*, June 8.

THE SOUTH STAFFORDSHIRE COAL-FIELD.—At the usual weekly meeting of the Birmingham Natural History and Microscopical Society, held at the Midland Institute, on Tuesday evening, the president in the chair, Mr. J. Percival read a paper "On the South Staffordshire Coal-field." After referring to the relation which the carboniferous measures hold to the other geological formations, the probable extent was shown of the two vast early coal deposits in England, which have since, by upheaval and denudation, formed the various recognized coal-fields. The origin of coal was next considered, and the merits of the "in situ" and drift theories were discussed. Whilst recognizing the vegetable origin of coal, it was urged that a form of carbon in addition to that contained in carbonic acid must have existed prior to the development of plants. The interesting experiments of Professor Tindley on the long-continued maceration of 177 species of plants, and the striking coincidence between those which most perfectly resisted decay, and those of which remains are found in the coal measures, was dwelt upon. The general physical features of the South Staffordshire field were then explained, and a brief description of the rocks, &c., found within its range was given. The special characters of the coal measures were more fully entered upon, particularly the wonderful formation, peculiar to this district, of the ten-yard or thick coal. Details were given of a pit where the coal attains the thickness of 31 feet 6 inches, with only a single "parting" of stone, averaging about five inches. The various seams, all differing in quality, into which the thick coal is divided, and their relative thicknesses, were explained and illustrated; comprising rooves coal, top slipper, or white coal, tow or hearth coal, Brazils, fine coals, veins, stone coal, Patchets, Sawyer, bottom slipper, and benches. The thin coal seams above and below the thick coal were also illustrated, and the probable cause of the breaking up of the thick coal of the south into various thin coal seams in the north of the field was shown. The modes of "getting" the thick coal by the "ribs and pillars" and by the "long-wall" systems were described. The number of deaths from accidental causes in coal-mines in various districts in England and Scotland was shown. Some of the most important "faults" were referred to. The formation of mineral matter in the fissures, &c., in the mass of the coal was the subject of a few remarks, and an interesting sample of pyrites was shown, which is known to have been formed amongst waste slack within a very recent and short period. The paper was copiously illustrated by diagrams and specimens.

Share List of Provincial Gas Companies.

(Directors and Managers of Gas-Works are earnestly requested to enable us to rectify any errors and fill up the omissions in the following List.)

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£	**ENGLAND.**	£ s d	£ s d	£ s d
360	5	Aberavon (Lim.).	5 0 0	6 0 0	5 0 0
		Aberdare.			
		Aberdovey			
400	5	Abergele (Lim.).	5 0 0	4 0 0	5 0 0
		Aberystwith			
530	10	Abingdon	10 0 0	6 0 0 & Bns.	12 0 0
1050	10	*Accrington G. & W.*	10 0 0		15 0 0
1050	10	Do., new shares.	10 0 0		15 0 0
2100	5	Do., do.	5 0 0		7 10 0
2100	5	Do., do.	1 0 0		1 10 0
2100	2½	Do., do.	0 10 0		0 15 0
1200	5	Airdale (Limited).	5 0 0	10 0 0	8 10 0
300	5	Do., new shares.	0 10 0	8 0 0	
24	75	Alcester	75 0 0	4 0 0	80 0 0
128	10	Aldborough (Lim.)	10 0 0	5 0 0	
269	10	Alderney	10 0 0	5 0 0	11 0 0
300	6	Alfreton	6 0 0	5 0 0	5 10 0
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	10 0 0	12 0 0
1600	5	Altrincham	5 0 0	6 0 0	6 0 0
		Amersham			
		Amlwch (Lim.)			
170	10	Ampthill	10 0 0	4 0 0	9 0 0
350	10	Andover	10 0 0	6 0 0	12 0 0
358	5	Appleby	5 0 0	2 10 0	2 15 0
260	10½	Arundel	10 10 0	7 10 0	13 0 0
250	10	Ashbourne, Derby.	10 0 0	6 0 0	13 10 0
292	5	Ashburton	5 0 0	5 0 0	
84	30	Ashby-de-la-Zouch	30 0 0	6 0 0	
700	10	Ashford (L.), Kent	10 0 0	6 0 0	11 10 0
1600	30	*Ashton-und-Lyne.*	30 0 0	10 0 0	60 0 0
590	5	Atherstone	5 0 0	9 0 0	8 10 0
		Attleborough			
		Axminster			
200	20	Aylesbury	20 0 0	5 0 0	21 0 0
150	10	Aylsham (L.), Nrfk	10 0 0	5 0 0 & Bns.	12 10 0
3093	10	*Bacup (Rossendale Union)* ordinary	10 0 0	8 10 0	16 0 0
600	10	Do., preference.	10 0 0	8 10 0	16 0 0
2597	10	Do., new issue	6 0 0	8 10 0	10 0 0
300	5	Bakewell	5 0 0	5 0 0	8 0 0
200	10	Baldock	10 0 0	5 0 0	10 0 0
1000	10	Banbury (Limited)	10 0 0	7 10 0	15 0 0
2650	10	*Bangor Gas & Wr.*	10 0 0	7 10 0	12 0 0
		Barmouth (L) £1500			
260	10	Barnard Castle	10 0 0	5 10 0	10 15 0
800	5	Barnet	5 0 0	6 0 0	5 10 0
		Barnsley £6000		7 10 0	
109	20	Barnstaple	20 0 0	7 10 0	
		Barrow-in-Furness Gas and Water		& Bns.	
1158	2	Barton-on-Humb.	2 0 0	5 0 0	2 0 0
120	25	Basingstoke	25 0 0	8 0 0	35 0 0
120	10	Do.	10 0 0	8 0 0	14 0 0
2500	16	*Bath*, A shares.	16 0 0	8 0 0	39 0 0
2500	8	Do., B shares.	8 0 0	7 0 0	united
2500	10	Do., C shares.	10 0 0	7 0 0	15 0 0
		Battle £2000		6 0 0	
56	26⅔	Bawtry	26 12 6	6 0 0	25 0 0
		Beaminster			
710	10	*Beccles Gas & Wr.*	10 0 0	2 10 0	
		Bedale, Yorkshire.			
300	30	*Bedford*	25 0 0	4 0 0	20 0 0
390	10	Bedworth	10 0 0	5 0 0	10 0 0
300	3	Belford	3 0 0		1 10 0
350	10	Belper	10 0 0	10 0 0	14 0 0
		Berkhampstead.			
1086	10	Berwick & Tweedmouth	10 0 0	8 10 0	15 0 0
120	20	Bewdley	16 0 0	5 0 0	16 0 0
200	10	Bicester	10 0 0	5 10 0	11 0 0
		Biddulph, Bradley Green, and Black Bull (Limited)			
330	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Billericay			
5000	5	*Bilston*	5 0 0	8 0 0	7 12 6
200	10	Bingham	10 0 0	4 0 0	
		Bingley £7400		4 0 0	
		Birchington (Lim.)			
1200	80	*Birmingham*, A shares.	80 0 0	9 0 0	137 10 0
400	8	Do., B shares.	8 0 0	9 0 0	13 15 0
3750	40	Do., new shares.	40 0 0	7 10 0	57 0 0
2400	50	*Birmingh. & Staff.*	50 0 0	10 0 0	98 to 99
2400	25	Do., new shares.	25 0 0	10 0 0	49 to 49½
7020	20	Do., do.	20 0 0	10 0 0	37 5 0
12500	28	Do., do.	7 0 0	7 10 0	11 10 0
250	16	*Birstall*	12 0 0	12s. 6d. per sh.	12 0 0
		Bishop's Auckland			
180	10	Bishop's Castle	10 0 0	5 0 0	10 0 0
230	10	Bishop's Stortford	10 0 0	5 0 0	10 0 0
		Bishp's Wlthm (L)			
6000	15	*Blackburn*, A sh.	15 0 0	9 0 0	27 0 0
6000	15	Do., B shares.	2 0 0	6 15 0	3 10 0
		Blaenavon G. & W.			
		Blandford			
		Blyth & Cowpen			
		Bodmin			
		Bodmin Consumers			
		Bognor			
100	10	Bolsover	10 0 0		10 0 0
7466	16½	*Bolton*	16 10 0	10 0 0	40 0 0
7466	16½	Do., new shares.	8 0 0	6 10 0	
		Boroughbridge (L)			
800	10	*Boston*	10 0 0	8 10 0	
1200	10	Do., new shares.		8 10 0	
		Botesdale (L), Suff.			
200	5	Boughton Blean	5 0 0	5 0 0	5 0 0
193	10	Bourn	10 0 0	5 0 0	
		Bournemouth Gas and Water			
160	10	Brackley	10 0 0	6 0 0	10 0 0
		Bracknell (Lim.)			
		Bradford, Wilts			
	25	*Bradford, Yorksh.*	25 0 0	10 0 0	49 0 0
		Braintree			
		Brampton, Cumb.			
		Brandon, Suffolk			
579	10	Brecon (Limited)	10 0 0	10 0 0	18 to 20
897000	Sk.	*Brentford*	All.	5 10 0	124 0 0
2000	20	Do., A shares.	1 0 0	7 10 0	
2187	20	Do., preference.	20 0 0	5 0 0	20 0 0
313	20	Do.	5 0 0	5 0 0	5 0 0
		Brentwood			
		Bridge, near Cant.			
		Bridge-end, Glam.			
		Bridgenorth (L)			
200	50	*Bridgwater*	50 0 0	7 0 0	50 0 0
520	10	Bridlington (L)	10 0 0	7 10 0	12 10 0
450	10	Bridport	10 0 0	7 10 0	12 0 0
6000	5	*Brierly Hill*	5 0 0	4 0 0	5 2 6
		Brigg			
		Brightlingsea (L)			
3375	20	*Brighton*	20 0 0	8 10 0	34 to 35
675	20	Do., new shares.	4 0 0	8 10 0	8 to 8½
4020	20	*Brighton & Hove*	20 0 0	9 0 0	29 0 0
		Brimscombe (L)			
191250	Sk.	*Bristol United*	Stock.	9 10 0	184 to 185
300	5	Briton-ferry	5 0 0		
150	8	Brixham	8 0 0	5 0 0	
		Broadstairs			
4000	5	*Bromley*, Kent	5 0 0	8 10 0	7 0 0
6000	5	Do., new shares.	10 0		1 0 0
		Bromsgrove			
100	10	Bromyard (Lim.)	10 0 0		
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 to 9
		Brymbo			
100	25	Buckingham	25 0 0	6 0 0	26 to 27
		Buntingford (Lim.)			
500	1	Burley-in-Wharfdale (Limited)	1 0 0	5 0 0	1 1 0
		Burnham, Bucks			
		Burnham (L) Essex			
		Burnham, Somers.			
1600	5	*Burslem and Tunstall*	5 0 0	10 0 0	9 0 0
2560	5	Do., new shares.	5 0 0	7 10 0	7 0 0
440	2½	Burton, Westmoreland (Limited)	2 10 0		
1200	10	*Bury St. Edmund's*	10 0 0	10 0 0	17 10 0
1800	10	Do., new shares.	3 0 0	7 10 0	4 4 0
303	10	Buxton (Limited)	10 0 0	7 10 0	14 0 0
150	10	Caistor	10 0 0	7 0 0	12 0 0
187	5	Callington	5 0 0		5 0 0
215	10	Calne, Wilts	10 0 0	6 0 0	10 0 0
		Calverley (L) York.			
		Camborne			
600	50	*Cambridge*	50 0 0	10 0 0	90 0 0
160	12½	Do., new shares.	12 10 0	10 0 0	22 10 0
640	8½	Do., do.	4 0 0	10 0 0	6 0 0
240	50	*Canterbury Gas & Water*	50 0 0		45 to 50
240	25	Do., new shares.	25 0 0	£6	22 to 25
240	12½	Do., do.	12 10 0		11 to 12½
240	6¼	Do., do.	6 5 0		5 to 6¼
800	25	*Cardiff*, A shares.	25 0 0	10 0 0	48 0 0
1200	25	Do., B shares.	25 0 0	8 0 0	37 0 0
400	25	Do.	7 10 0	8 0 0	14 0 0
		Cardigan (Limited)			
160	25	Carmarthen	25 0 0	5 0 0	30 0 0
		Carnarvon			
		Carshalton			
200	6	Castlecary	6 0 0		5 0 0
200	10	Castle Donnington	10 0 0	6 0 0	12 14 0
249	5	Castleford	5 0 0	5 0 0	5 0 0
400	5	Castletwn. I. of M.	5 0 0	5 0 0	5¼ to 5½
620	2	Cawood (Limited)	2 0 0	4 0 0	
		Chatteris			
300	10	Cheadle	10 0 0	5 0 0	10 0 0
200	50	Chelmsford	50 0 0	8 0 0	70 0 0
200	25	Do., new shares.	25 0 0	8 0 0	35 0 0
2500	16	*Cheltenham*, A shares.	16 0 0	8 0 0	
2500	8	Do., B shares.	8 0 0	7 0 0	
		Do., new shares.		7 0 0	
500	10	*Chepstow*, A sh.			
200	10	Do., B shares.			
600	5	*Chertsey Consumrs*	5 0 0	5 0 0	6 15 0
600	1½	Do.,	1 10 0	5 0 0	2 0 0
600	2½	Do.,	1 10 0		
230	10	Chesham	10 0 0	5 0 0	10 10 0
300000	Sk.	*Chester United*	Stock.	10 0 0	182 0 0
246501		Do., preference.	,,	7 0 0	142 to 144
535	10	Do, new shares.	10 0 0	7 0 0	14 0 0
250	5	Chester-le-Street	5 0 0	6 0 0	5 0 0
192000	Sk.	*Chesterfield Gas & Water*	100 0 0	5 0 0	178 0 0
400	50	Do., new shares.	50 0 0	5 0 0	52 0 0
		Chesterton (L)			
240	25	Chichester	25 0 0	6 0 0	31 10 0
		Chippenham			
329	10	Chipping Norton (Limited)	10 0 0	5 0 0	
100	10	Chipping Ongar	10 0 0	2 10 0	5 0 0
838	20	Chorley	20 0 0	7 0 0	27 0 0
		Chowbent, Lanc.			
		Christchurch			
200	5	Church Stretton (L)	5 0 0		5 0 0
680	10	Cirencester	10 0 0	5 0 0 & Bns.	11 0 0
		Clay Cross			
		Clayton, Allerton, and Thornton			
357	10	Cleckheaton, A shares.	10 0 0	7 10 0	
357	10	Do., B shares.	10 0 0	7 10 0	
357	10	Do., new shares.	2 10 0	7 10 0	
350	10	Clevedon	10 0 0	4 10 0	10 0 0
		Clitheroe			
1132	5	Cockermouth	5 0 0	5 0 0	5 5 0
300	5	Coggeshall	5 0 0		4¼ to 5
900	20	Colchester	20 0 0	7 0 0	22¼ to 23
		Coleford, Glocester			
		Coleshill (L.) £2000			
160	10	Collingham (Lim.)	10 0 0	5 0 0	10 0 0
		Collumpton			
328	5	Colnbrook, Middsx.	5 0 0	5 0 0	5 0 0
150	20	Colne, Lancashire	20 0 0		36 0 0
150	10	Do., ¼ shares.	10 0 0		18 0 0
150	5	Do., ¼ shares.	5 0 0	£10	9 0 0
150	5	Do., A shares.	5 0 0		9 0 0
150	5	Do., B shares.	5 0 0		9 0 0
150	5	Do., C shares.	2 0 0		5 0 0
200	25	*Congleton*	25 0 0	5 0 0	31 0 0
320	5	Conway (Limited).	5 0 0		5 0 0
		Corsham			
1600	25	*Coventry*	25 0 0	8 0 0	35 0 0
	25	Do., new shares.	25 0 0	7 10 0	
200	10	Cowbridge	10 0 0	3 0 0	5 0 0
500	10	Cowes	10 0 0	5 0 0	
		Cradley Heath			
190	10	Cranbrook. £1900	10 0 0	7 10 0	
		Crawley		4 10 0	
		Crayford & Bexley.			
		Crays			
420		Crediton	5 0 0	5 0 0	6 0 0
225	10	Crewkerne	10 0 0	6 0 0	10 0 0
		Cricklade (L.) £1000			
200	10	Croft & Hurworth	9 0 0		
1200	1	Crook (Limited)	1 0 0	10 0 0	1 5 0
		Croston (Limited).			
251	5	Crowland	5 0 0	7 0 0	
181	10	Crowle, Lincoln	10 0 0	10 0 0	
4000	5	*Croydon Commrcl.*	5 0 0	7 10 0	7 0 0
3560	4	Do.	4 0 0	7 10 0	5 0 0
		Cuckfield			
250	20	Dartford	20 0 0	7 0 0	27 0 0
700	5	Dartmouth (Lim.)	5 0 0	7 0 0	6 0 0
125	20	Daventry	20 0 0	5 0 0	24 8 0
165	10	Dawley	10 0 0	5 0 0	10 0 0
346	5	Dawlish	5 0 0	8 0 0	7 10 0
1400	10	*Deal & Walmer*	10 0 0	7 0 0	10 0 0
1400	1¼	Do.	1 5 0	4 0 0	4 0 0
350	10	Do.	5 0 0	7 0 0	7 0 0
1200	1	Deddington	1 0 0		
		Dedham (L.) £1000			
		Delph, Yorkshire			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
1650	25	*Derby*	25 0 0	10 0 0	52¼ to 53½
		Dereham			
7000	5	*Devonport*	5 0 0	9 0 0	9 0 0
3000	5	Do., preference	4 0 0	5 0 0	4 0 0
7400	5	*Dewsbury & Batley*	5 0 0	10 0 0	10 0 0
3700	5	Do., new shares.	5 0 0	7 10 0	7 10 0
		Diss			
		Dolgelly			
160	10	Donnington	10 0 0	5 0 0	10 0 0
340	27½	Dorchester	25 0 0	5 0 0	27 10 0
120	25	Dorking	24 0 0	5 0 0	25 0 0
		Donnington, Linc.			
192	25	Douglas, I. of Man	25 0 0	8 0 0	30 0 0
21945	Sk.	*Dover*	100 0 0	6 0 0	100 0 0
1855	10	Do., new shares.	10 0 0	6 0 0	10 0 0
500	10	Dowlais (Limited).	10 0 0	8 0 0	12 0 0
25	60	Downham Market.	60 0 0	7 10 0	
		Driffield			
3000	5	*Drighlington and Gildersome*	5 0 0	7 10 0	7 10 0
		Droitwich			
1000	20	*Droylsden*	9 0 0	8 5 0	
600	30	*Dudley*	30 0 0	6 6 0	38 to 40
1500	20	*Dukinfield*	13 0 0	10 0 0	28 0 0
200	10	Dunmow	10 0 0	5 0 0	10 0 0
		Dunstable			
900	10	Durham	10 0 0	10 0 0	£26
900	10	Do., new shares.	5 10 0	10 0 0	
250	10	Dursley, Gloucstr.	9 0 0	6 0 0	9 5 0
150	5	Easingwold	5 0 0	5 0 0	
400	10	Eastbourne	10 0 0	5 0 0	11 0 0
90	20	East Dereham	20 0 0	5 0 0	21 0 0
356	5	East Grinstead	5 0 0	6 0 0	5 0 0
		Easton (Limited)		5 0 0	
1200	5	East Retford	5 0 0	10 0 0	7 10 0
		Eckington & Mosboro' (Limited)			
		Egremont, Cumb.			
703	6¼	*Elland*	6 10 0	8 0 0	10 0 0
800	5	Elsecar (Limited).	5 0 0	5 0 0	5 12 0
		Eltham			
200	10	Emsworth			
400	5	Enfield	5 0 0	5 0 0	5 0 0
		Epping (Limited)			
300	19	Epsom & Ewell	19 0 0		
		Erith			
325	10	Eton—Cannel Gas (Limited.)	10 0 0	5 0 0	10 0 0
700	10	Evesham (Lim.)	10 0 0	6 0 0	9¼ to 10
1600	25	*Exeter*	25 0 0	8 0 0	40 to 42
250	10	*Exmouth*	10 0 0	5 0 0	10 0 0
58	25	Eye	25 0 0	5 0 0	25 0 0
170	10	Fairford	10 0 0	3 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Fakenham(L)£3500			
		Falkingham			
100	38	*Fareham*	38 0 0	5 0 0	
223	25	Farnham	25 0 0	7 0 0	35 0 0
		Farnworth and Kearsley			
		Farringdon			
140	50	Faversham	50 0 0	6 0 0	
		Fazeley (L.) £3000			
120	10	Fenny Stratfd.(L.)	10 0 0	5 0 0	11 0 0
	5	Filey	5 0 0	5 0 0	5 0 0
1200	10	*Folkestone*	10 0 0	10 0 0	15 0 0
280	5	Framlingham	5 0 0	5 0 0	5 10 0
1155	1	Frodsham (Lim.)	1 0 0	2 10 0	1 0 0
320	25	Frome	25 0 0	10 0 0	
		Furness Gas and Water			
12000*l*	Sk.	*Gainsborough*	All	6 13 4	120 to 121
400	20	Do., new shares	7 10 0	6 13 4	8½ to 9
170	10	Gillingham (Lim.) Dorset	10 0 0	3 0 0	
103	25	Glastonbury	25 0 0	4 0 0	15 0 0
600	10	*Glossop*	10 0 0	9 0 0	16 0 0
600	5	Do.	5 0 0	9 0 0	8 0 0
1800	10	Do., new shares	6 10 0	7 10 0	8 10 0
1000	25	*Gloucester*, A shares	25 0 0	10 0 0	42 0 0
856	25	Do., B shares	18 15 0	7 10 0	25 0 0
260	20	Godalming	20 0 0	5 0 0	20 0 0
300	5	Do., new shares	5 0 0	5 0 0	5 0 0
100	20	Do., do.	8 0 0		
100	5	Do., do.	2 0 0		
621	5	*Gomersal*	5 0 0	6 0 0	6 7 6
		Gorleston & Sthdn.			
854	25	*Gosport*	25 0 0	9 0 0	
450	20	Grantham	20 0 0	7 0 0	28 0 0
1000	20	*Gravesend*	20 0 0	5 0 0	21 0 0
		Grays Thurrock			
643	5	Gt. Berkhampstd.	5 0 0	6 0 0	5 10 0
1000	10	*Great Grimsby*	10 0 0	10 0 0	17 0 0
1000	6½	Do., new shares	4 10 0	10 0 0	8 2 6
700	5	Great Harwood	5 0 0	4 5 0	
280	5	Do., new shares	1 0 0		
210	10	Great Marlow	10 0 0	5 0 0	10 0 0
		Great Torrington			
450	5	Great Wigston	5 0 0	6 0 0	
150	1	Do., new shares	1 0 0	6 0 0	
1300	10	Guernsey	9 0 0	10 0 0	17 0 0
352	25	*Guildford*, A sh.	25 0 0		
352	3	Do., B shares	3 0 0		
		Do., new shares			
25	100	Guisborough	60 0 0	10 0 0	
		Hadleigh Cons.(L)			
240	5	Hadlow (Limited)	5 0 0		
140	10	Hailsham	10 0 0	6 0 0	10 0 0
40	50	Halesowen	50 0 0	6 0 0	
300	5	Halesworth	5 0 0	7 10 0	6 0 0
240	5	Haltwhistle (Lim.)	5 0 0	4 10 0	5 0 0
		Hampton			
1000	10	*Harrogate*	10 0 0	8 10 0	13 10 0
1000	3½	Do., new shares	3 6 8	8 10 0	4 10 0
900	10	Do., do.	1 10 0		47s. to 41s.
6800	5	*Hartlepool Gas & Water*	5 0 0	7 0 0	6 17 6
3322	5	Do., new shares	5 0 0	7 0 0	6 17 6
9878	5	Do., do.	1 10 0	7 0 0	
1000	1	Hartley Wintney, Harwich	1 0 0	2 10 0	21s. to 23s.
662	6	*Haslingden*	6 0 0	10 0 0	10 0 0
343	6	Do., A shares	4 0 0	10 0 0	6 0 0
1840	25	*Hastings and St. Leonards*	25 0 0	9 0 0	
180	10	Hatfield			
		Harlow and Sawbridgeworth			
500	5	Havant	5 0 0	3 0 0	5 0 0
120	10	Haverhill	10 0 0	5 0 0	10 0 0
840	5	Hawick	5 0 0	10 0 0	8 12 6
244	5	Haworth	5 0 0		5 5 0
		Hay (L.), Brecon			
		Haydon Bridge			
6000	1	Hebden Bridge	1 0 0	9 0 0	1 10 0
170	10	Heckington (Lim.)	10 0 0		10 0 0
		Heckmondwike			
120	10	Hedon (Limited)	10 0 0	3 0 0	
145	12	Helston	12 0 0	9 0 0	
250	10	Hemel Hempstead	10 0 0	4 0 0	7 0 0
300	10	Henley (Limited)	10 0 0	6 0 0	10 0 0
		Hereford. £10,000		4 10 0	
300	10	Herne Bay	10 0 0	6 0 0	11 0 0
1300	10	*Hertford*	8 0 0	7 10 0	12 0 0
		Hessle (L.) £1500			
470	10	Hexham	10 0 0	8 0 0	14 0 0
400	25	*Heywood*	25 0 0	7 10 0	40 0 0
400	25	Do., new shares	25 0 0	7 10 0	37 10 0
160	10	Higham Ferrers	10 0 0	7 0 0	12 0 0
		Highworth, Wilts.			
520	5	High Wycombe	5 0 0	6 0 0	6 16 0
300	10	Hinckley	10 0 0	7 10 0	10 0 0
600	5	Hindley, Lancash.	3 0 0		3 0 0
200	20	Hitchin	20 0 0	8 0 0	
200	5	Do., new shares	5 0 0	8 0 0	
		Hoddesden			
555	20	*Holmfirth*	19 0 0	5 0 0	19 0 0
960	5	Holyhead	5 0 0	6 0 0	6 2 6
		Holywell (*see* Brit. Provincial)			
98	25	Honiton	25 0 0	3 12 0	20 0 0
1250	1	Honley (Limited)	1 0 0	5 0 0	1 0 0
6	500	Horncastle	£500		
		Hornsey (Lim.)			
1200	2½	Horsforth	2 10 0		2 10 0
193	20	Horsham	20 0 0	10 0 0	26 0 0
	10	Houghton-le-Sprg.	10 0 0	8 0 0	
		Howden			
1700	20	*Huddersfield*	20 0 0	10 0 0	37 5 0
250	20	Do., new shares	15 0 0	10 0 0	
		Hull			
		Hull-Sculcoates (*see* Brit. Prov.)			
210	10	Hungerford	10 0 0	5 0 0	10 0 0
860	10	*Huntingdon*	10 0 0	9 0 0	16 10 0
140	10	Do., new shares	2 10 0	9 0 0	
		Hurstperpoint			
600	10	Huyton & Roby	10 0 0	10 0 0	15 0 0
2500	10	*Hyde*	9 0 0	5 10 0	10 15 0
400	10	Hythe & Sandgate	10 0 0	6 0 0	10 15 0
		Idle & Eccleshill (*see* Airdale)			
		Ilford			
198	12	Ilfracombe	2 0 0	4 0 0	8 to 9
560	6½	Ilkestone	6 5 0	11 4 0	8 0 0
		Ilkley			
		Ilminster			
250	5	Ingatestone (Lim.)	5 0 0	1 10 0	
2800	10	*Ipswich*	10 0 0	10 0 0	16 0 0
1400	10	Do.	5 0 0	7 10 0	7 0 0
		Ironbridge			
180	10	Irthlingborough	10 0 0	7 0 0	10 0 0
800	30	*Isle of Thanet* (Margate & Ramsgate.)	30 0 0	10 0 0	30 to 35
		Jersey, St. Helier's			
363	5	Kelvedon (Lim.)	5 0 0		
1842	10	*Kendal United Gas and Water*	9 0 0	10 0 0	17 0 0
380	20	Do., preference	20 0 0	7 10 0	32 0 0
290	10	Kenilworth (Lim.)	10 0 0	4 0 0	10 0 0
400	5	Keswick	5 0 0	5 0 0	4 0 0
228	25	Kettering	25 0 0	6 0 0	30 0 0
		Ketton (L.) Rutld.		7 0 0	
		Keynsham			
		Kibworth, £2000.			
		Kiddrmstr, £10,000		5 0 0	
800	5	Kidsgrove	5 0 0	12 0 0	7 10 0
150	10	Kimbolton	10 0 0	7 0 0	12 0 0
140	7	Kingsbridge	7 0 0		10 to 11
270	5	King's Cliffe	5 0 0	5 10 0	5 0 0
		Kingstn-on-Tham.			
		Kingswinford District, (Limited)			
		Kington, Hereford			
400	5	Kinver, Staffordsh.	5 0 0		5 0 0
		Kirby Lonsdale			
		Kirkburton			
400	5	Kirkby Stephen (L.)	5 0 0		
330	5	Kirkham, Lanc.	5 0 0	4 0 0	5 0 0
330	2½	Do., new shares	2 10 0	4 0 0	2 10 0
200	10	Kirton-in-Lindsey	10 0 0	5 0 0	10 10 0
200	5	Knighton (L.)	5 0 0		
1000	10	*Knottingley*			
670	5	Knutsford Gas and Water (Limited)	5 0 0	8 0 0	5 10 0
319	5	Do.,	3 0 0	8 0 0	3 10 0
470	31½	*Lancaster*	31 10 0	7 2 10	47 0 0
470	6gs.	Do.	6 6 0	7 2 10	9 8 0
564	15⅔	Do.	15 15 0	7 2 10	23 10 0
50	25	Langport	25 0 0	4 0 0	15 0 0
		Launceston			
		Lea Bridge (*see* County & Gen)			
1500	20	*Leamington Priors*	20 0 0	10 0 0	30 0 0
250	20	Do., new shares	20 0 0	5 0 0	20 0 0
213	10	Leatherhead	10 0 0	5 0 0	10 0 0
		Ledbury			
		Leeds Company—Consolidated stk.	£100	6 0 0	113 to 114
6790	5	Do., new	1 0 0	6 0 0	1 12 6
		Leeds New Comp—Old stock	£100	10 0 0	179 to 180
		New do.	£100	6 0 0	108 to 110
6500	5	Do., B shares	5 0 0	6 0 0	¼ to ⅜ pm.
		Leeswood (Lim.)			
3900	13	*Leicester*	13 0 0	10 0 0	24½ to 25½
3900	10	Do., new shares	10 0 0	7 10 0	15 to 16
2990	10	Do., new shares	4 0 0	7 10 0	7 0 0
		Leigh		7 0 0	
476½	21	Leighton Buzzard	21 0 0	8 0 0	30 0 0
500	10	Leominster	10 0 0	5 0 0	9 10 0
330	25	Lewes, A shares	25 0 0	8 0 0	31 5 0
644	5	Do., B shares	5 0 0		6 5 0
245	5	Leyburn, Yorksh.	5 0 0		6 0 0
		Leyland, Lancash.			
250	20	Lichfield	20 0 0	10 0 0	40 0 0
320	25	*Lincoln*	25 0 0	10 0 0	70 0 0
300	5	Lindfield (Limited)	5 0 0	8 0 0	5 0 0
240	5	Liskeard	5 0 0	7 10 0	6 0 0
		Littleborough			
240	5	Littlehampton	5 0 0	10 0 0	5 0 0
	Sk.	*Liverpool United*	£100	10 0 0	211 to 213
	25	Do., ¼ share	25 0 0		52½ to 52½
259	5	Llandovery (Lim.)	1 10 0	7 0 0	
1086	10	Llandudno Gas and Water	10 0 0	7 0 0	12 0 0
		Llanelly £3000			
		Llanfyllin(L) £2000			
		Llangollen			
250	10	Llanrwst(Limited)	9 15 0	5 0 0	9 15 0
		Loddon			
		Long Buckby (L.)			
120	10	Long Sutton(Lim.)	10 0 0	7 10 0	11 to 12
2000	5	Longton (Lim)	5 0 0	10 0 0	7 10 0
		Longwood, near Huddersfield			
250	5	Lostwithiel	5 0 0	4 0 0	6 0 0
250	1	Do., new shares	1 0 0	5 0 0	1 10 0
1422	6	Loughborough	6 0 0	10 0 0	11 15 0
240	25	*Louth*	25 0 0	10 0 0	35 0 0
2500	10	*Lowestoft G. & W.*			
611	5	Ludlow Union	5 0 0	5 0 0	5
250	5	Do., pref. shares	5 0 0	5 0 0	
640	10	*Luton*	10 0 0	7 10 0 & Bns.	12 0 0
640	5	Do., preferential	5 0 0	4 0 0	5 0 0
640	5	Do., new shares	5 0 0	7 10 0 & Bns.	6 0
100	20	Lutterworth	20 0 0	6 5 0	25 0 0
		Lydney (L.) £3000			
63	20	Lyme Regis	20 0 0	4 0 0	20 0 0
120	25	Lymington	25 0 0	5 0 0	25 0 0
		Lymm			
300	10	Maidenhead	10 0 0	5 0 0	10 0 0
500	25	*Maidstone*, A sh.	25 0 0	10 0 0	45 0 0
500	25	Do., B shares	25 0 0	4 0 0	20 0 0
	25	Do., new shares	25 0 0	7 10 0	
204	23	Maldon	23 0 0	7 0 0	27 0 0
200	10	Malmesbury	10 0 0	2 10 0	5 15 0
		Malpas (Limited)			
		Malvern Link			
		Manningtree			
		Mansfield £5000		10 0 0	
150	10	Mansfield Woodhse	10 0 0		
		March			
		Margate (*see* I. of Thanet)			
		Market Drayton			
132	25	Market Harboro'	25 0 0	7 0 0	35 0 0
		Market Weighton			
		Markyate St. (L.)			
		Marlborough			
150	10	Marsden(Lim.)	10 0 0	5 0 0	10 0 0
650	20	Maryport	14 0 0	7 0 0	
600	5	Matlock (Lim)	5 0 0	6 0 0	
508	5	Matlock Bridge, Matlock Bank, & Matlk. Town (L.)	5 0 0	6 0 0	
200	2	Measham (Lim.)	1 12 6	5 0 0	
220	10	Melbourne	10 0 0	6 0 0	12 0 0
		Melksham			
934	2	Meltham	2 0 0	4 10 0	
		Melton Mowbray			
50	10	Mere	10 0 0		
		Merthyr Tydvil			
120	10	Middleham	10 0 0	5 0 0	10 0 0
3000	10	*Middleton*		10 0 0	
		Middleton-in-Teesdale			
400	5	Midhurst (Lim.)	5 0 0	2 10 0	5 0 0
		Midsmmr. Norton			
198	5	Mildenhall	5 0 0	5 0 0	
300	5	Milnthrpe(L) £1500	4 10 0	3 6 8	
184	10	Milverton (Lim.)	10 0 0	5 0 0	10 0 0
2000	5	*Mirfield*	5 0 0	5 0 0	6 5 0
700	10	Mitcham	10 0 0	10 0 0	14 10 0
650	5	Mold Gas & Water	5 0 0	7 10 0	6¼ to 6¼
700	10	Monmouth Gas & Water	10 0 0	5 0 0	10 0 0
250	5	Montgomery (L.)	5 0 0		
150	10	Moreton-in-Marsh	9 2 6	4 0 0	9 2 6
1000	5	Morley, nr. Leeds	5 0 0	10 0 0	8 10 0
1000	2	Do.	2 0 0	10 0 0	3 8 0
220	16	Morpeth	16 0 0	5 0 0	17 10 0
		Mossley			
		Mottram			
		Nayland			
		Neath			
185	10	Needham Market	10 0 0	4 0 0	
		Nelson (L.) £5000			
		Nethrthng(L.)£700			
		Newark £5000		10 0 0	
		Newburn			
250	20	Newbury	20 0 0	5 0 0	20 0 0
16000	8	*Newcastle & Gateshead*	8 0 0	7 0 0	13 to 13¼
		Newcastle-under-Lyne			
250	5	Newent	5 0 0		
		Newhaven, Sussex			
		New Malton			
600	5	Newmarket	5 0 0	4 0 0	4 0 0
366	2	Do., preference	2 0 0	6 0 0	2 0 0
		New Mill (L.) £7000			
200	20	*New Mills & Hayfield*	15 10 0	5 0 0	
70	20	Newnham (Lim.)	20 0 0		21 0 0
		Newport Pagnell			
360	35	*Newport, Mon.*, A shares	35 0 0	9 0 0	50 0 0
540	35	Do., B shares	35 0 0	7 10 0	42 10 0
		Newport, Salop			
250	5	New Romney (Ld.)	5 0 0	5 0 0	5 0 0
		Newton Abbott			
198	10	Newtown, Mont.	10 0 0	6 0 0	10 0 0
		Northallerton			
777	20	*Northampton*, A shares	20 0 0	10 0 0	38 0 0
777	20	Do., B shares	20 0 0	4 0 0	14 0 0
777	20	Do., C shares	20 0 0	7 10 0	29 0 0
2331	5⅔	Do.	1 6 8	7 10 0	1 18 0
		North Bierley			
		Northfleet (*see* Co. & General)			
		Northleach			
2914	5	North Shields	5 0 0	5 0 0	6 to 6½
120	10½	North Walsham	10 10 0	5 0 0	10 15 0
371	15	Northwich	15 0 0	5 0 0	15 0 0
		Norwich (*see* Brit. Provincial)			
4000	50	*Nottingham*	50 0 0	5 0 0	
	50	Do., new shares	50 0 0	5 10 0	63 0 0
268	8	Nuneaton (Lim.)	8 0 0	5 0 0	7 10 0
125	8	Do., new shares	8 0 0	5 0 0	7 10 0
		Oaken Gates, Salop			
240	5	Oakhampton(Lim.)	5 0 0		
200	10	Odiham	10 0 0	5 0 0	10 0 0
		Olney			
360	10	*Ormskirk*, old sh.	10 0 0	8 0 0	14 0 0
1080	10	Do., new shares	4 10 0	8 0 0	6 4 6
2400	5	*Ossett & Horbury*	5 0 0	8 0 0	9 0 0
		Oswestry			
		Otley, Yorkshire			
80	25	Oundle	25 0 0	7 0 0	25 0 0
600	15	*Over Darwen*, Original	15 0 0	5 0 0	19 0 0
600	15	Do., A shares	15 0 0	5 0 0	19 0 0
1200	15	Do., B shares	7 10 0	5 0 0	10 0 0
1694	1	Over & Wharton	1 0 0		1 2 0
120	150	*Oxford*. .(Lim.)	£150	9 10 0	300 0 0
1527	5	Padiham	5 0 0	6 0 0	6 0 0
338	2½	Painswick	2 10 0		2 10 0
		Pangbrne (L) £1500			
		Pately Br., Yorksh.			
300	5	Peel, Isle of Man	5 0 0	7 0 0	6 to 7

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Pembroke (*see* Co. and General)			
500	20	*Peniston*			
250	20	Penrith	15 0 0	6 10 0	21 0 0
153	20	Penzance	20 0 0		15 0 0
		Pershore			
320	5	Petersfield	5 0 0	5 0 0	
200	10	Petworth	10 0 0	9 17 6	18 6 8
100	10	Do., new shares	7 10 0	9 17 6	14 10 0
1200	2	Pewsey (Limited)	2 0 0	5 0 0	2 0 0
		Pickering			
2500	10	*Plymouth & Stonehouse*	10 0 0	10 0 0	19 0 0
2500	10	Do., new shares	10 0 0	7 10 0	14 0 0
2500	10	Do., new shares	3 0 0	7 10 0	4 10 0
160	10	Pocklington	10 0 0		5 0 0
		Ponder's End & Enfield Highway (L)			
		Pontefract		4 0 0	
		Pontypridd			
400	10	Poole	10 0 0	10 0 0	15 0 0
344	2	Do., new shares	2 0 0	10 0 0	3 0 0
643	5	Port Madoc (Lim.)	5 0 0	5 0 0	
		Port Talbot			
600	53	*Portsea Island*	53 0 0	8 0 0	60 0 0
600	50	Do., new shares	50 0 0	8 0 0	57 0 0
600	50	Do., new shares	49 0 0	8 0 0	56 0 0
9000	Sk.	Do.		5 0 0	92 0 0
120	10	Potton, Bedfordsh.	10 0 0	5 0 0	10 0 0
400	10	Prescott	10 0 0	5 0 0	
		Presteign			
60000	Sk.	*Preston*	All.	10 0 0	208 15 0
3000	20	Do., new shares	18 0 0	10 0 0	39 0 0
1000	10	Provincial (Hull)	8 0 0		8 0 0
600	20	*Pudsey*	20 0 0	7 10 0	30 0 0
600	6⅔	Do., new shares	4 13 4	7 10 0	4 13 4
93	20	Pwllheli	20 0 0	2 10 0	25 0 0
600	5	Quorndon & Mountsorrel	5 0	7 0 0	12 0 0
900	10	*Radcliff & Pilkington*, No. 1	10 0 0		
2100	10	Do., No. 2	6 0 0		
200	20	Ramsay, I. of Man.	20 0 0	6 10 0	23 0 0
		Ramsey, Hunts			
		Ramsgate (*see* I. of Thanet)			
		Rastrick			
		Rawmarsh			
20000	Sk.	*Reading*	100 0 0	8 0 0	120 5 0
5000	,,	Do.	100 0 0	5 0 0	100 10 0
1000	10	Do.	10 0 0	7 0 0	11 0 0
500	10	Do., preference	10 0 0	5 0 0	10 10 0
		Redbourn (L) £1100			
400	5	Redcar	5 0 0	4 0 0	5 0 0
1200	5	*Redhill*	5 0 0	6 0 0	5 5 0
		Redruth			
		Reigate			
1200	1	Repton (Limited)	1 0 0	5 0 0	1 1 0
2000	10	Richmond, Sry. (L)	10 0 0	7 0 0	15 0 0
		Rhosllanerchrugog			
		Rhymney (Lim.)			
400	5	Rickmansworth	5 0 0		5 0 0
180	10	Ringwood	10 0 0	5 0 0	10 0 0
180	33⅓	Ripon	33 10 0	4 10 0	
		Robin Hd's Bay (L)			
		Rochester & Chat.		6 0 0	
		Rochford			
		Romford			
200	25	Romsey			
7500	Sk.	*Rotherham*, A stock	100 0 0	10 0 0	186 to 190
2500	Sk.	Do., B stock	100 0 0	8 0 0	152 to 154
600	20⅔	Do., new shares	10 0 0	8 0 0	14½ to 15
		Rothwell			
350	10	Royston	10 0 0	5 0 0	9 10 0
150	20	Rugby	20 0 0	10 0 0	
150	5	Do., ¼ shares	5 0 0	10 0 0	
150	6⅔	Do., ¼ shares	6 13 4	10 0 0	
150	10	Do., new shares	10 0 0	10 0 0	
150	2½	Do., do.	2 10 0	10 0 0	
150	3⅓	Do., do.	3 6 8	10 0 0	
430	10	Rugely	10 0 0	5 0 0	10 10 0
		Runcorn £11,000		7 10 0	
114	31¼	Ruthin	31 5 0	6 16 0	40 0 0
1000	10	Ryde	10 0 0	8 0 0	12 10 0
500	10	Do., new	5 0 0		7 10 0
500	5	Rye	5 0 0	6 0 0	6 0 0
		Saddleworth			
225	22	Saffron Walden	22 0 0	4 0	16 to 18
1400	5	St. Alban's Gas & Water (Lim.)	5 0 0	5 0 0	5 5 0
320	5	St. Asaph (Lim.)	5 0 0		
		St. Austell			
		St. Bees (Lim.)			
		St. Colomb			
3000	10	*St. Helen's*	10 0 0	10 0 0	18 10 0
		St. Ives, Cornwall			
		St. Mary's Cray			
400	25	*Salisbury*	25 0 0	6 0 0	28 0 0
341	10	Sandbach	10 0 0	5 0 0	12 10 0
		Sandown (Lim.)			
381	10	Sandwich	10 0 0	5 0 0	
		Sandy, Beds			
100	10	Saxmundham	10 0 0	5 0 0	
2000	10	*Scarborough*	10 0 0	7 0 0	13 0 0
1000	10	Do.	6 0 0	7 0 0	12 2 6
240	5	Sedburgh	5 0 0		
300	16	Selby	16 0 0	7 10 0	
140	5	Settle (Limited)	3 10 0	5 0 0	
290	10	Sevenoaks	10 0 0	4 0 0	10 0 0
300	10	Shaftesbury (Lim.)	10 0 0	5 0 0	8½ to 9
565	5	Sheepshed (Lim.)	5 0 0	6 0 0	6 0 0
135000	Sk.	*Sheffield United*, A stock	100 0 0	10 0 0	196 to 197
39264	Sk.	Do., B stock	100 0 0	8 0 0	195 to 196
2530	30	Do., C shares	1 10 0	8 0 0	15 7 6
4800	16g.	Do., D shares	13 0 0	8 0 0	28 5 0
1600		Do., E shares		8 0 0	
600	5	Shefford (Limited)	4 0 0		
		Shelton, Potteries (*see* Brit. Prov.)			
2182	5	Sheppy, Sheerness	5 0 0	10 0 0	7 0 0
18	5	Do., pref. sh.	5 0 0	5 0 0	
800	5	Do., pref. sh.	5 0 0	4 0 0	
350	10	Shepton Mallet	10 0 0	7 10 0	10 0 0
1000	5	Sherborne	5 0 0	7 10 0	5 0 0
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	7 10 0
150	10	Shipston-on-Stour	10 0 0	4 0 0	
		Shirley & Freemantle, Hants			
240	25	Shotley Br. (Lim.)	25 0 0	7 0 0	19 0 0
240	10	Do., new shares	10 0 0	7 0 0	8 0 0
1000	10	*Shrewsbury*, A shares	10 0 0	10 0 0	20 0 0
1000	10	Do., B shares	10 0 0	5 0 0	10 0 0
1000	10	Do., new shares	10 0 0	7 10 0	15 0 0
		Sible Hedingham			
7000	Sk.	*Skipton*	100 0 0	9 0 0	150 0 0
400	2½	Do., new shares	2 10 0	5 0 0	3 0 0
		Slaithwaite			
250	20	Sleaford	20 0 0	5 0 0	20 0 0
250	10	Slough	10 0 0		
340	5	Snaith	5 0 0		4 0 0
		Soham			
150	10	Somerton	10 0 0		
354	5	Southam	5 0 0		
1000	50	*Southampton*	50 0 0	10 0 0	
		Southborough			
		Southend, Essex			
220	10	South Molton	10 0 0	5 10 0	7 10 0
		South Petherton (L)			
2000	10	*South Shields*	10 0 0	9 0 0	14 2 6
248	10	Southwell (Lim.)	10 0 0	5 0 0	11 to 11½
300	5	Southwold	5 0 0	5 0 0	5 0 0
1470	1	Spennymoor (Lim.)	1 0 0		
400	5	Spilsby	5 0 0		
		Spittal, Berwick-on-Tweed			
2000	6⅔	*Stafford*	6 13 4	10 0 0	10 0 0
2000	6⅔	Do., new shares	4 0 0	8 0 0	5 0 0
178	5	Staindrop	5 0 0	6 0 0	5 0 0
248	25	Staines & Egham	25 0 0	6 0 0	26 to 27
		Staley Bridge		10 0 0	
225	50	*Stamford & St. Martin's*	50 0 0	9 0 0	75 0 0
150	10	Staveley (Limited)	10 0 0	5 0 0	11 10 0
300	5	Stevenage	5 0 0	5 0 0	5 0 0
2500	10	*Stoke, Fenton & Longton*	10 0 0	10 0 0	
500	10	Do.,	2 0 0	10 0 0	
400	5	Stone, Stafford	5 0 0	5 0 0	6 0 0
220	10	Stoney Stratford	10 0 0	4 10 0	9 0 0
		Storrngtn (L) £1000			
		Stourbridge, £5000			
		Stow-on-the-Wold			
150	20	*Stratford-on-Avon*	20 0 0	10 0 0	40 0 0
150	5	Do., new shares	5 0 0	10 0 0	10 0 0
375	8	Do., preference	8 0 0	5 10 0	8 10 0
750	5	*Stretford*	5 0 0	9 0 0	5 0 0
		Stroud			
251	20	Sudbury	20 0 0	5 0 0	20 0 0
		Sunbury (L), Mid.			
28500	5	*Sunderland*	5 0 0	9 0 0	9 5 0
200	10	Sutton Coldfield (L)	10 0 0		10 0 0
350	10	Sutton-in-Ashfield	10 0 0	7 10 0	12 10 0
		Sutton Southcoates & Drypool, Hull	20 0 0		23 to 24
		Sutton, Surrey			
600	5	Swadlincote	5 0 0	5 0 0	5 0 0
169	10	Swaffham	10 0 0	5 0 0	7 0 0
240	25	*Swansea*	25 0 0	10 0 0	45 to 50
1280	25	Do., new shares	25 0 0	7 10 0	34 10 0
		Swindon			
		Swindon New (L)			
200	10	Swineshead (Lim.)	10 0 0	5 0 0	10 5 0
1000	5	Swinton & Mexboro'	5 0 0	7 0 0	7 0 0
180	10	Syston	10 0 0		10 0 0
276	5	Tadcaster	5 0 0	5 0 0	3 0 0
		Tamworth			
		Taporley (Lim.)			
		Tattershall & Coningsby (Lim.)			
2800	5	*Taunton*	5 0 0	6 0 0	6 0 0
2800	1¼	Do., new shares	1 10 0	6 0 0	
800	6¼	Tavistock	3 3 9	6 0 0	5 10 0
200	5	Tenbury Union	5 0 0	5 0 0	5¼ to 6
150	10	Tenterden	10 0 0	4 0 0	8 0 0
200	10	Tetbury, Gloster	9 0 0	5 0 0	
		Tewkesbury			
200	10	Thame	10 0 0	5 0 0	10 0 0
250	10	Thetford	10 0 0	6 0 0	10 to 11
150	10	Thornbury (Lim.)	10 0 0	4 0 0	
80	1	Do., new shares	1 0 0	4 0 0	
356	5	Thorne	5 0 0		4 0 0
160	10	Thrapston (Lim.)	10 0 0	5 0 0	10 0 0
		Tideswell (L.) £2000			
1885	5	Todmorden (Lim.)	5 0 0	7 10 0	7 10 0
1870	5	Do., B shares	3 0 0	7 10 0	4 10 0
600	2½	Topsham (Lim.)	2 10	5 0 0	
		Torpoint (Lim.)			
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes Consumers			
5000	5	*Tottenham & Edmonton*	5 0 0	8 0 0	6 0 0
150	10	Towcester	10 0 0	5 0 0	10 0 0
		Town-Malling			
275	10	Tring	10 0 0	5 0 0	10 0 0
		Trowbridge (*see* Brit. Provincial)			
320	25	Truro	25 0 0	10 0 0	
		Tunbridge			
2000	10	*Tunbridge Wells*	10 0 0	10 0 0	19 0 0
100	10	Tuxford	10 0 0	5 0 0	12 0 0
		Twyford (Limited)			
		Ulverston			
		Uppingham			
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
309	5	Usk (Limited)	5 0 0	8 0 0	6 12 6
250	10	Uttoxeter	10 0 0	5 0 0	13 0 0
		Uxbridge			
		Ventnor			
160	10	Wainfleet (Lim.)	10 0 0		8 0 0
1000	25	*Wakefield*	25 0 0	10 0 0	44 0 0
3660	5	Do.,	5 0 0	10 0 0	8 16 0
1732	5	Do., new shares	5 0 0	7 10 0	6 15 0
		Walker & St. Anthony (L.) £2000			
300	10	Wallingford	10 0 0	5 0 0	8 0 0
		Walton-on-Tham. (*see* Co. & Gen.)			
200	10	Wantage	9 0 0	5 0 0	10 10 0
		Ware (*see* C. & G.)			
100	10	Wareham	10 0 0	3 10 0	8 0 0
2000	1	Warkwth & Amble	1 0 0	3 10 0	
200	25	Warminster	25 0 0	6 0 0	28 0 0
900	20	*Warrington*	20 0 0	10 0 0	39 to 39½
900	20	Do., new shares	15 0 0	10 0 0	29 0 0
		Warth			
		Warwick. £15,000		6 0 0	
		Watford			
400	10	Weedon (Limited)	10 0 0	6 10 0	12 10 0
400	3	Do., new shares	1 10 0	6 10 0	1 17 6
111	25	Welchpool, Montg.	25 0 0	5 0 0	25 0 0
200	25	Wellingborough	25 0 0	5 0 0	25 0 0
450	10	Wellington, Salop	10 0 0	7 10 0	12 10 0
		Wellington, Som.			
160	25	*Wells*, Somerset	25 0 0	10 0 0	
		Wem (Lim.) £2000			
		W. Auckld. & St. Helen's, Auckld (L)			
160	10	Westbury	10 0 0		
		West Cowes			
225	10	Westerham (Lim.)	10 0 0	5 0 0	11 0 0
454	5	West Malling Gas and Water	5 0 0	3 0 0	4 10 0
200	20	*Weston-sup.-Mare* A shares	20 0 0	10 0 0	30 0 0
200	20	Do., B shares	20 0 0	7 10 0	20 0 0
800	20	Do., C shares	3 5 0	7 10 0	3 5 0
200	5	Wetherby	5 0 0		1 10 0
2000	10	*Weymouth*			
		Whaley Bridge			
2300	1	Whitchurch, Hants	0 10 0	2 10 0	
400	25	Whitehaven	25 0 0	2 0 0	14½ to 15
		Whitehaven New			
		Whitstable			
		Whittington			
250	10	Whittlesea	10 0 0	5 0 0	11 0 0
300	10	Whitwick & Coalville	10 0 0		10 0 0
1200	5	*Whitworth Vale*	5 0 0	4 0 0	7 0 0
1200	5	Do., new shares	4 7 6	4 0 0	6 7 6
		Widnes Gas & Wtr.			
1250	10	*Wigan*	10 0 0	10 0 0	20 0 0
1250	10	Do., preference	10 0 0	5 0 0	10 0 0
2500	10	Do., new shares	5 0 0	7 10 0	8 15 0
400	5	Wigston	5 0 0	6 0 0	5 0 0
		Wigton, Cumberd.			
1020	5	*Willenhall*, A shares	5 0 0		
1020	54*s.*	Do., B shares	2 14 0	5 0 0	
		Do., new shares			
		Wilton			
600	10	Wimbledon	8 0 0		8 0 0
240	10	Wimborne Minster	10 0 0		
130	10	Wincanton	10 0 0	7 0 0	
		Winchcombe £1500			
		Winchester Gas & Water			
		Windermere Dist.			
1100	20	Windsor (Limited)	20 0 0	6 5 0	23 0 0
141	10	Winslow	10 0 0	6 0 0	10 0 0
120	10	Winterton (Lim.)	10 0 0	5 0 0	
120	5	Do., new shares	5 0 0	5 0 0	
200	10	Wirksworth	10 0 0	5 0 0	10 0 0
		Wisbeach			
		Witham			
		Witney			
400	5	Wiveliscombe (L.)	5 0 0	6 0 0	5 5 0
		Wivenhoe (L) £2000			
200	10	Woburn	10 0 0	5 0 0	11 0 0
210	10	Wokingham	10 0 0	5 0 0	
4448	10	*Wolverhampton*	10 0 0	10 0 0	19 0 0
4448	10	Do., new shares	6 0 0	10 0 0	12 2 6
550	10	Woodbridge (Lim.)	10 0 0	10 0 0	
660	2½	Woodstock	2 10 0	5 0 0	
		Woodhouses			
200	7	Wooler	7 0 0		
2400	5	*Woolwich Consrs.*	5 0 0	10 0 0	8 0 0
2400	5	Do., do.	5 0 0	7 10 0	7 0 0
4800	5	Do., do.	3 0 0	7 10 0	4 0 0
		Woolwh. Equitable			
2400	10	*Worcester*	10 0 0	8 0 0	14 7 6
		Workington			
600	10	*Worksop*	10 0 0	5 0 0	
600	5	Do., new shares	5 0 0	5 0 0	
		Worthing			
		Worsboroughdale & Worsboro.			
270	12	Wotton-un.-Edge	12 0 0	4 0 0	7 0 0
600	5	Wrexham, A sh.	5 0 0	7 10 0	5 0 0
600	5	Do., B shares	5 0 0	5 0 0	5 0 0
600	5	Do., C shares	3 10 0	5 0 0	3 10 0
		Writtle			
		Wye, Kent			
		Wylam			
400	5	Wymondham	5 0 0	6 10 0	5 0 0
		Yarmouth, I. of W.			
800	30	*Yarmouth, Norflk.*	30 0 0	7 10 0	
800	7½	Do., ¼ shares	7 10 0	7 10 0	
1675	4	Yeadon & Guiseley	4 0 0	5 0 0	4 8 0
1675	2	Do., new shares	0 5 0	5 0 0	0 5 6
140	30	Yeovil	30 0 0	6 0 0	30 0 0
140	10	Do., new shares	10 0 0	6 0 0	10 0 0
		York Town			
15000	10	*York United*	5 0 0	10 0 0	10 10 0
		Yoxford			

—

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share	Div. per Cent. per Annum.	Price per Share.
	£	**SCOTLAND.**	£ s d	£ s d	£ s d
26000	2½	Aberdeen	2 10 0	10 0 0	5 1 0
		Abernethy			
		Aberlour(L.) £650.			
500	10	Airdrie	10 0 0	9 0 0	14 10 0
		Alloa			
		Alva, nr. Stirling			
		Alyth			
600	5	Annan	5 0 0	5 0 0	5 0 0
1600	1	Anstruther & Cellardyke	1 0 0	8 0 0	1 6 0
825	20	Arbroath	20 0 0	7 10 0	30 0 0
100	20	Ardrossan	20 0 0	5 0 0	20 0 0
658	1	Auchinleck	1 0 0		
381	5	Auchterarder	5 0 0	7 10 0	7 10 0
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
2932	5	Ayr	5 0 0	6 0 0	5 16 0
4250	2	Ayr & Newton Cons.	2 0 0	6 0 0	2 2 0
300	10	Banff	10 0 0	6 0 0	11 0 0
2158	1	Barrhead	1 0 0	7 10 0	1 0 0
200	5	Bathgate	5 0 0	5 0 0	5 0 0
		Beith			
976	1	Bervie	1 0 0	5 0 0	
		Biggar			
739	5	Blairgowrie	5 0 0	8 0 0	7 0 0
		Blantyre (Lim.)			
400	6	Borrowstowness	6 0 0	5 0 0	6 0 0
540	5	Brechin	5 0 0	10 0 0	11 2 6
		Bridge of Allan			
4175	2	Broughty Ferry	2 0 0	4 0 0	2 0 0
		Campbelton			
250	4	Carluke, Lanark	4 0 0	7 10 0	4 0 0
178	5	Castle Douglas	5 0 0	5 0 0	5 0 0
2330	3	Coatbridge	3 0 0	10 0 0	5 0 0
200	5	Coldstream	5 0 0	6 0 0	5 0 0
		Collinsburgh			
1000	1	Comrie	1 14 8	4 10 0	1 14 8
		Corstorphine			
1200	1	Crail, Fife	1 0 0	5 0 0	1 0 0
2744	1	Crieff	1 0 0	10 0 0	1 15 0
600	1	Cullen	1 0 0	5 0 0	0 15 0
280	2½	Cumbernauld	2 10 0	5 0 0	2 10 0
200	5	Cumnock	5 0 0	6 0 0	6 0 0
600	5	Cupar Angus	5 0 0	7 0 0	6 10 0
250	10	Cupar Fife	10 0 0	10 0 0	18 10 0
300	10	Dalkeith	10 0 0	10 0 0	20 0 0
		Deanston			
750	2	Denny	2 0 0	6 5 0	2 5 0
		Denny Consumers			
	5	Dornoch			
500	1	Douglas	1 0 0	6 0 0	1 2 0
		Dufftown			
		Dumbarton			
400	20	Dumfries	14 0 0	7 2 10	14 10 0
391	5	Dunbar	5 0 0	6 0 0	5 10 0
		Dunblane			
1250	23⅓	*Dundee*	23 15 0	8 15 9	54 0 0
8000	5	*Dundee, New*	5 0 0	5 0 0	5 15 0
860	10	Dunfermline	10 0 0	10 0 0	16 10 0
		Dunkeld			
1750	2	Dunoon	2 0 0	6 0 0	2 3 0
		Dunse			
250	5	Dysart	5 0 0	7 10 0	6 10 0
2327	1	East Wemyss	1 0 0	6 0 0	1 2 0
750	1	Ecclefechan	1 0 0		
6000	25	*Edinburgh*	25 0 0	10 0 0	51 0 0
6400	25	*Edinburgh & Leith*	25 0 0	8 0 0	50 0 0
621	12	Elgin	12 0 0	6 0 0	13 0 0
1300	1	Elie & Earlsferry	1 0 0	7 5 0	1 3 0
		Ellon			
		Errol			
		Eyemouth			
	14	Falkirk	14 0 0	7 0 0	14 0 0
		Falkirk, New			
632	2	Falkland	2 0 0	5 0 0	2 0 0
		Fettercairn			
2000	1	Ferry Porton Craig	1 0 0	6 5 0	1 3 0
581	1	Fochabers	1 0 0	5 0 0	1 2 0
1440	5	Forfar	5 0 0	7 10 0	7 12 6
360	5	Do., new shares	2 10 0	7 10 0	6 10 0
		Fort William			
2000	1	Fraserburgh	0 16 0	5 0 0	0 18 0
500	5	Galashiels	5 0 0	10 0 0	9 10 0
		Gatehouse, n. Fleet			
900	2½	Girvan	2 10 0	6 0 0	2 10 0
5200	25	*Glasgow*	25 0 0	10 0 0	50 0 0
3200	6¼	Do., ¼ shares	6 5 0	10 0 0	12 10 0
1000	25	Do., new shares	25 0 0	7 10 0	38 0 0
15000	10	*Glasgow City and Suburban*	10 0 0	10 0 0	20 0 0
5000	10	Do., new shares	10 0 0	7 10 0	15 0 0
		Grahamston			
190	10	Grangemouth	10 0 0	5 0 0	10 0 0
400	8½	Haddington	8 5 0	7 10 0	11 10 0
		Hamilton			
	5	*Hamilton, New*	5 0 0	4 10 0	6 0 0
300	5	Helensburgh	5 0 0	7 10 0	7 10 0
2000	2	Holywood (Lim.)	2 0 0	7 10-0	3 0 0
1312	1	Huntly	1 0 0	7 10 0	1 5 0
250	5	Inverary	5 0 0	10 0 0	6 12 6
425	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness G. & Wr.*	10 0 0	7 10 0	13 10 0
2400	5	Do., new shares	3 15 0	7 10 0	5 0 0
		Inverury			
	10	Irvine	10 0 0	10 0 0	14 0 0
	2½	Do.	2 10 0	10 0 0	3 12 6
300	5	Jedburgh	5 0 0	7 10 0	7 10 0
		Johnstone, Paisley			
		Kamesburgh (L.)			
1300	1	Keith	1 0 0	5 0 0	0 11 0
600	5	Kelso	5 0 0	10 0 0	11 0 0
620	2	Kelsyth	2 0 0	5 0 0	2 0 0
950	1	Kennoway	1 0 0	5 0 0	1 1 0
1515	1	Kettle Freuchie & Kettle Bridge	1 0 0	5 0 0	5 0 0
600	25	Kilmarnock	25 0 0	7 10 0	30 0 0
600	25	Do., new shares	7 10 0	7 10 0	
334	5	Kincardine	5 0 0	5 0 0	4 10 0
		Kinghorn			
		Kingskettle, Fife			
		Kinross			
1200	5	Kirkcaldy	5 0 0	10 0 0	10 10 0
320	5	Kircudbright	5 0 0	5 0 0	5 0 0
997	3	Kirkintulloch	3 0 0	6 13 4	3 7 0
		Kirkwall			
		Kirriemuir			
		Lanark			
3500	1	Lanark Conrs. (L.)	1 0 0	7 10 0	1 2 6
		Largo, near Leven			
280	8	Largs	8 0 0	7 10 0	8 10 0
1309	1	Lasswade	1 0 0		
177	5	Lauder	5 0 0	5 0 0	5 0 0
2000	1	Leslie, Fife	1 0 0	7 10 0	1 5 0
618	1	Lesmahago	1 0 0	6 0 0	1 0 0
		Leuchars			
906	5	Leven	5 0 0	7 0 0	7 0 0
100	10	Linlithgow	10 0 0	10 0 0	19 0 0
		Linton			
		Lochee, n. Dundee			
434	5	Lochgilphead(Ld.)	5 0 0	7 0 0	5 10 0
380	5	Lochwinnoch	5 0 0	3 10 0	4 0 0
		Macduff			
1200	1	Markinch, Paisley	1 0 0	8 0 0	1 5 0
		Maryhill, n. Glasg.			
282	3	Mauchline	3 0 0	5 0 0	3 0 0
667	5	Maxwll T. & Dumf.	5 0 0	5 0 0	3 to 3½
423	5	Maybole, Ayrshire	5 0 0	4 10 0	5 0 0
		Meigle (L.) £700			
373	2	Melrose	2 0 0	7 10 0	2 10 0
718	2	Mid & East Calder	2 0 0		2 0 0
200	5	Moffat	5 0 0	5 0 0	
120	2½	Do., new shares	2 10 0	5 0 0	
400	20	Montrose	20 0 0	10 0 0	35 0 0
		Muirkirk (L.) £1000			
1000	5	Musselburgh	5 0 0	8 0 0	9 0 0
618	1	Nairn	1 0 0	5 0 0	1 0 0
		Neilston, n. Glasg.			
300	5	Newburgh, Fife	5 0 0	8 0 0	7 0 0
300	1	Do., new shares	1 0 0	8 0 0	
1200	1	Newmilns	1 0 0	7 10 0	1 2 0
1300	1	Newport, Fife	1 0 0	5 0 0	1 0 0
		Newton-on-Ayre			
107	14½	Newton Stewart	14 10 0	5 0 0	14 10 0
300	5	N. Berwick, N.B.	5 0 0	5 0 0	7 10 0
		N. Queensferry			
245	5	Oban	5 0 0	7 10 0	5 7 6
1000	5	Peebles	5 0 0	6 0 0	5 0 0
500	2½	Do., new shares	2 10 0	6 0 0	2 10 0
1000	25	Perth	25 0 0	5 0 0	25 0 0
3000	5	Perth, New	5 0 0	1 0 0	
		Peterhead			
2000	1	Pettenween	1 0 0	6 0 0	1 1 0
2416	1	Pollokshaws	1 0 0	7 10 0	1 5 0
		Port Glasgow			
		Portobello			
		Portsoy			
200	5	Prestonpans	5 0 0	6 0 0	
1594	1	Renton, Dumbrtn.	1 0 0	7 10 0	1 1 6
		Rothes			
1500	1½	Rutherglen	1 6 8	5 0 0	1 6 8
250	12	St. Andrew's	12 0 0	8 6 8	16 10 0
193	12	Do., new shares	12 0 0	8 6 8	16 10 0
400	5	Saltcoats	5 0 0	7 10 0	6 0 0
936	1	Sanquhar	1 0 0	5 0 0	0 15 0
30	1	Do., preference	1 0 0	5 0 0	
400		Selkirk	5 0 0	10 0 0	10 0 0
508	1	South Queensferry	1 0 0	5 0 0	1 0 0
200	5	Stewarton	5 0 0	10 0 0	6 to 6½
7450	2	Stirling	2 0 0	7 0 0	2 16 0
2500	1	Stonehaven	1 0 0	6 5 0	1 5 0
1110	1	Stonehouse	1 0 0	7 10 0	13s. to 15s.
600	2½	Stornoway	2 10 0	8 0 0	3 10 0
		Stow (Limited)			
500	5	Stranraer	5 0 0	7 10 0	6 12 6
588	2	Strathaven	2 0 0	8 0 0	3 0 0
643	2½	Thurso	2 10 0		2 10 0
		Tillicoultry			
		Turriff			
800	1	Tranent	1 0 0	5 0 0	1 0 0
		Troon			
		Tullibody			
2051	1	Wemyss & Bkhn.	1 0 0	6 0 0	1 0 0
		Wick			
665	5	Wigtown	5 0 0		
		IRELAND.			
1800	1	Antrim (Limited)	1 0 0		1 0 0
		Ardee			
300	10	Armagh (Lim.)	10 0 0	10 0 0	20 2 6
500	5	Athy (Limited)	4 0 0	6 0 0	5 0 0
		Balbriggan £1400			
		Ballycastle			
700	6	Ballymena & Harryville (L.)	6 0 0	8 0 0	6 4 0
184	10	Ballymoney	10 0 0	5 0 0	10 0 0
220	5	Ballynahinch(Ld.)	5 0 0	5 0 0	5 0 0
		Ballyshannon £2000			
		Bangor, Down			
700	80	*Belfast*	80 0 0	10 0 0	140 to 148
2450	20	Do., new shares	20 0 0	10 0 0	35 to 37
		Boyle (Limited)			
1047	5	Carlow	5 0 0	5 0 0	5 0 0
600	5	Carrickfergus(Ld.	5 0 0	8 0 0	6 5 0
197	10	Carrickmacross(L.)	10 0 0	5 0 0	10 0 0
300	10	Carrick-on-Suir	10 0 0	6 0 0	10 0 0
228	10	Castleblaney (Ld.)	10 0 0	5 0 0	10 0 0
400	5	Cavan (Limited)	5 0 0		5 0 0
		Clones (L.) £2000			
2000	5	Clonmel Consmrs.	5 0 0	6 0 0	5 0 0
240	5	Comber (Limited)	5 0 0	5 0 0	5 0 0
500	5	Cookstown	5 0 0	5 0 0	
		Coote Hill			
12000	5	Cork Conrs. (Lim.)	5 0 0	8 0 0	8 10 0
6000	5	Do., new shares	1 0 0	8 0 0	3 5 0
		Donaghadee £2000			
608	11	Drogheda	11 0 0	7 0 0	14 10 0
420	5½	Do., new shares	5 10 0	7 0 0	7 5 0
		Dublin Hibernian (*see* Untd. Gen.)			
19000	10	*Dublin Alliance*	8 0 0	9 0 0	12¾ to 13
440	25	Dundalk (Limited)	25 0 0	8 0 0	25 0 0
456	10	Dundrum(Limited)	6 0 0	5 0 0	6 0 0
600	5	Dungannon	5 0 0	5 0 0	6 0 0
871	5	*Downpatrick*	5 0 0	4 0 0	4 0 0
249	10	Ennis (Limited)	10 0 0		11 0 0
240	25	Galway	25 0 0	10 0 0	35 0 0
		Gorey (L.) £2000			
		Holywood (Lim.)			
		Keady			
600	5	Kells (L.) Meath	5 0 0	6 0 0	5 0 0
600	10	Kilkenny (Limited)	10 0 0	8 0 0	12 0 0
		Killarney (L.) £3000			
		Kilrush			
		Kinsale (L.) £2000			
210	10	Larne (Limited)	10 0 0	5 0 0	10 0 0
150	10	Letterkenny (Ld.)	10 0 0	5 0 0	12 10 0
		Limerick (*see* U.G.)			
500	10	Lisburn (Limited)	8 0 0	10 0 0	10 0 0
300	5	Lismore	5 0 0	3 0 0	
100	5	Do., preference	3 0 0	5 0 0	
600	15	Londonderry	15 0 0	6 13 4	21 0 0
		Longford			
540	10	Lurgan	8 0 0	6 0 0	9 0 0
		Mallow			
2191	1	Maryborough(Ld.)	0 5 0		0 5 0
		Midleton			
770	5	Monaghan (Lim.)	5 0 0	4 10 0	5 16 0
2000	10	Navan	5 0 0	6 0 0	4 0 0
		Nenagh			
1400	5	Newry Conrs. (L.)	5 0 0	10 0 0	8 3 0
450	5	Newtownards	5 0 0	7 0 0	6 5 0
200	10	Newtownlimavady	10 0 0	5 0 0	10 0 0
		Omagh	5 0 0	7 10 0	6 0 0
500	5	Portadown	20 0 0	5 0 0	21 0 0
125	20	Portaferry			
500	10	Queenstown	10 0 0	6 0 0	10 0 0
200	10	Do., new shares	5 0 0	6 0 0	5 0 0
		Roscommon £2500			
		Saintfield(L.) £1000			
600	10	Sligo	10 0 0	8 0 0	12 10 0
600	5	Do., new shares	5 0 0	8 0 0	6 5 0
		Tandragee (Lim.)			
		Tuam (L.) £3000			
540	5	Tullamore	5 0 0	6 0 0	5 0 0
240	5	Tullow	5 0 0		5 0 0
		Warrenpoint £3000			
1600	10	*Waterford*	10 0 0	6 0 0	12 0 0
300	10	Wicklow (Lim.)	10 0 0	6 0 0	10 0 0

The Gas-Works in the undermentioned towns belong to private individuals. Those marked * by the purchase of the shares in extinct companies:—

Aldershot.	Bungay.	Ellesmere.	Harrow-on-the-Hayle. [Hill.	Mold Green, nr. Huddersfield.	Pontypool.	Stowmarket.
Alford.	Burntisland.	Enniscorthy.	Holbeach.	Nantwich*.	Redditch.	Thirsk.
Ballina.	Chapel-en-le-Frith.	Falmouth.	Holt.	Nettlebed.	Rhyl.	Tipperary.
Barking*.	Chard.	Farsley.	Hunmanby.	Newport (Isle of Wight).	St. Blazey (Cornwall).	Tiverton*.
Beaufort (Brecon).	Clare, Suffolk.	Fermoy.	King's Langley.	New Ross.	St. Ives* (Hunts).	Waltham Abbey.
Beaumaris.	Crewe.	Ferry Hill.	Leiston (Suffolk).	Oakham*.	St. Neots*.	Wem.
Berkeley.	Crickhowell.	Fleetwood.	Lynn.	Parsonstown.	Seaham.	Wexford.
Billericay.	Dingwall.	Goole.	Market Deeping.	Penryn.	Sidmouth.	Whitby*.
Bodmin.	Eccleshill, near Leeds.	Hadleigh.	Milnrow, nr. Manchester.	Peterborough.	Sittingbourne.	Whitchurch(Salop).
Broadbottom.		Halstead.			Southall, Midlsex.	Willington Quay & Howdon.
Brynmawr.		Harleston.			Stokesley.	

The Gas-Works belong to Local Boards or to Municipal Corporations, or to Commissioners acting under special Acts of Parliament, in the following towns:—

Abergavenny.	Brighouse.	Devizes.	Layton with Warbrick (Lanc.)	Milton (Kent).	Rothesay.	Tenby.
Athlone.	Burnley.	Doncaster.	Leek.	Newton (Lanc.)	Salford.	Tralee.
Ballinasloe.	Burton-on-Trent.	Enniskillen.	Limerick Corporation Works.	Oldham.	Southport.	Trim (Meath).
Bethesda, Bangor.	Bury (Lanc.).	Great Malvern.	Lytham (Lanc.).	Paisley.	Sowerby Bridge.	Tyldesley & Shakerley.
Beverley.	Carlisle.	Greenock.	Macclesfield.	Renfrew.	Spalding.	Wallasey.
Birkenhead.	Cashel.	Halifax.	Manchester.	Richmond(Yorks.)	Stockport.	Walsall.
Blackpool.	Coleraine.	Haverfordwest.	Middlesborough.	Ripon.	Stockton-on-Tees.	Wells (Norfolk)
Bollington (Cheshire).	Dalton.	Keighley.	Ross.	Rochdale.	Strabane.	Workington.
	Darlington.	Knaresborough.			Teignmouth.	Youghall.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	5 6 0	5 7 6
10000	5	Do., second issue	3 0 0	5 0 0	3 to 3¼
10000	5	Do., third issue .	1 0 0	5 0 0	1¼ to 1⅜
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29½ to 30
8200	20	Do., new . . . . (Norwich, Huit-Sculcoates, Shelton Potteries, Trowbridge, & Holyweil.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	78¾ to 79¼
6000	50	Do.	30 0 0	10 0 0	48 to 48½
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7¼ to 7⅜
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L.) Colonial & General	5 0 0		3 to 4
17490	25	*Commercial* . . .	25 0 0	10 0 0	43 to 43¾
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	20 5 0
17500	20	Do.	10 0 0	8 0 0	10 5 0
5827	5	County & Gen. (L.)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	33 to 34
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13¾ to 14
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	7 0 0
20000	10	*Great Central Gas Consumers* . . .	10 0 0	10 0 0	16¼ to 16¾
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	85 to 86
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	92½ to 93
3000	40	*Independent* . . .	40 0 0	10 0 0	71 to 73
3000	10	Do.	10 0 0	5 0 0	8 10 0
3000	20	Do.	7 0 0	7 10 0	9 0 0
6886	50	*London*	50 0 0	10 0 0	80 to 80⅝
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 9 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
187814		Do., 1st pref. sk		6 0 0	
118284		Do., 2nd pref. sk		5 0 0	
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff* . . . . Rio de Janeiro (L).	20 0 0	10 0 0	35 to 37
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15 7 6
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . (Dublin & Limerick)	50 0 0	4 12 0	35½ to 36
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16¾ to 16¾
10000	10	Do., B shares.	5 0 0	10 0 0	8½ to 8½
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ⅜ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 6

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	5s. 9d
Cork	9s. 6d. to 9 6
Dover, Folkestone, and Ramsgate	6 3
Dublin	9s. 6d. to 10 0
Exeter Quay	8 6
Ipswich	5 6
London (from Leith)	8 6
London (Pool)	6 0
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7s. to 7 3
Plymouth	7 9
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel:—

Barcelona	£24 10s. to £25 10s
Bordeaux	13 0
Boulogne and Calais	£7 to 7 10
Cadiz	17 0
Copenhagen	£9 to 9 5
Genoa	£22. 15s. to 23 0
Hamburg	£8 to 8 5
Havre de Grace	£9 to 9 5
Leghorn	23 0
Lisbon	16 0
Rotterdam	7 10
Stettin	10 12
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 6
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	86 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (in London), p. ton	8 0 0
Foreign Spelter, p. ton	22 5 0
English Block Tin, p. ton	94 0 0
Banca, p. ton	95 0 0
Tarred Rope Yarn, p. cwt.	1 0

Advertisements.

THE GRANTHAM GASLIGHT COMPANY.

TO CONTRACTORS.

THE Directors are desirous of receiving TENDERS for the Construction of a GASHOLDER-TANK, 62 ft. 6 in. diameter and 20 ft. deep.

Plans and specifications may be seen at the Company's Office, Grantham.

Tenders will be received up to twelve o'clock on Wednesday, the 19th of July.

The Company do not engage to accept the lowest or any tender.

THOS. WINTER,
Clerk to the Company.

THE GRANTHAM GASLIGHT COMPANY.

TO GASHOLDER MANUFACTURERS.

THE Directors are desirous of receiving TENDERS for the Construction and Erection of a GASHOLDER, 60 ft. diameter, and 20 ft. deep.

Plans and specification may be seen at the Company's Office, Grantham, on and after the 4th of July.

Tenders will be recieved up to twelve o'clock on Wednesday, the 19th of July.

The Company do not engage to accept the lowest or any tender.

THOS. WINTER,
Clerk to the Company.

BOROUGH OF LIVERPOOL.

CARTS AND WHEELBARROWS.

THE Health Committee are desirous of receiving TENDERS for supplying 150 CARTS and 500 WHEELBARROWS, for the collection of the Refuse and Night Soil of the Borough.

The Carts are to be for One Horse only; to be capable of removing 30 to 35 cwt. of soil and refuse, either in a liquid or dry state; and to be constructed so as to discharge their contents by tipping.

Lithographed Plans of the Tipping Places will be forwarded to persons desirous of tendering, on application to James Newlands, Esq., Borough Engineer, Liverpool, from whom any further information required may be obtained.

The Carts and Wheelbarrows are to be strong and substantial. Designs of such as are proposed to be supplied are to accompany the tenders, together with description of the material to be used.

The Committee do not bind themselves to accept the lowest tender.

Tenders to be addressed "Chairman of Health Committee," endorsed "Tender for Carts and Barrows," to be left at the Town Clerk's Office, Public Offices, Cornwallis Street, Liverpool, on or before the 20th July instant. By order,

WM. SHUTTLEWORTH,
Town Clerk.

Public Offices, Cornwallis Street,
Liverpool, July 4, 1865.

DUNFERMLINE TOWN AND CONSUMERS GAS COMPANY, LIMITED.

WANTED, an Engineer, to Supply Plans and Specifications of Gas-Works for the above Company.

The Company are likewise prepared to receive applications for the office of Manager, who would be also required to superintend the Works during their construction.

Applications, with testimonials, to be lodged with JOHN LANDALE, Town Clerk, Dunfermline, on or before Saturday, the 15th instant.

Dunfermline, July 4, 1865.

TO BE SOLD, a Set of 4 Cast-iron DRY-LIME PURIFIERS, each 7 ft. 3 in. by 6 ft. 3 in., and 3 ft. 9 in. deep, with complete hydraulic centre valve, and revolving lifting-crane for the covers. Three tiers of cast perforated shelves in each, and 8-in. connexions.

The above purifiers are in good condition, and sold in consequence of larger having been substituted.

The Company have also for sale at a low price, in very good condition, a 3-horse TABLE STEAM-ENGINE.

The whole may be inspected and particulars known on application to Mr. GIFFORD, Gas Company's Office, CAMBRIDGE.

July, 1865.

CONTENTS.

Notes upon Passing Events:— PAGE

The Engineers and Contractors in the new House of Commons . . 565
The Cholera in Egypt 566

Circular to Gas Companies:—

The Phœnix Gas Company and "E. H. M." 567
The Right of Gas Companies to Cease to Supply Gas to Defaulters . 567
Decision of the Lancashire Quarter Sessions on the Application of the Ashton Gas Consumers Association 568
Election of Joseph Cowen, Esq., for Newcastle-on-Tyne 568
Mr. Sugg's Tables for Determining the Quantity of Sulphur in Gas 568
Transfer of the Gas-Works of the Ross Commissioners to a Private Individual 568
Rise in the Price of Gas in Whitehaven 568

Communicated Articles:—

Experiments on the Action of the Sulphides of Ammonium upon the Bisulphide of Carbon and Sulphuretted Hydrocarbons in Coal Gas . 568
Import Duties on Gas Apparatus in Austria 570

Correspondence:—

Anderson's Retort Settings 571

Register of New Patents:—

Moe, A.—Double-Action Submerged Force-Pump 571
Taylor, T.—Urinals 571
Grant, A. G.—Clockwork Magnesium Lamp 571
Durfee, Z. S.—Gas-Generator 571
Taylor, S. T.—Iron Pipes 572
Cafferata, J. R.—Gaseliers 572
Holt, R.—Hoods for Ventilators 572
Stevens, C.—Machine for Forcing up Water 572
Chrimes, R.—Hydrants, or Fire-Cocks 572
Brandon, D. H.—Treatment of Tar Oils 572
Burns, J. H.—Distillation of Volatile Minerals 572
Hughes, E. T.—Fan for Ventilating 572
Bennison, H.—Fluid-Meters 572
Weems, J. and W.—Engine-Governors, and Apparatus for Indicating and Regulating the Flow of Fluids 572
Defries, C.—Lighting and Ventilating 573
Croll, A. A.—Treatment of Sulphate of Alumina 573
Cowles, W. S.—Casks for Petroleum, &c. 573
Laming, R.—Ammoniacal Preparations 573
Brown, T.—Ventilating Cap 574
Haseltine, G.—Purifying Coal and Ore 574
Beckton, J. G.—Heating Retort and other Ovens for the Distillation of Shale, Coal, &c. 574
Cassell, J.—Treating Coal, Peat, Shale, Wood, &c., and obtaining Fuel, Oil, and other Products therefrom 574
Lambert and Soper—Taps, Cocks, or Valves 575
Vaughan, J. I.—Manufacture of Resins and Resinous Substances . . 575
Wilkins, F.—Production of Hydrocarbon Vapour 575
Applications for Letters Patent 575
Grants of Provisional Protection 575
Notices to Proceed 575
Patents which have become Void 575

Legal Intelligence:—

Salford Sessions.—The Ashton Gas Consumers Association and the Ashton Gas Company 576

Miscellaneous News:—

Meeting of the European Gas Company 577
Metropolitan Board of Works—The Nuisances at Crossness and Barking Outfall Sewers 578
Metropolis Gas Supply—Meeting in Bermondsey 579
The New Member for Newcastle-on-Tyne 580
On the Flame of certain Carburetted Gases, and in particular that of Acetylene and Cyanogen 580
Dr. Hillier's Report on the Gas supplied by the Imperial Gas Company to the Vestry of St. Pancras during the month of April 582
Mr. Young's Paraffin Projects 582

Share List of Metropolitan Gas Companies 583

Share List of Water Companies 583

Price Current 584

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, August 8, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JULY 25, 1865.

Notes upon Passing Events.

THE new House of Commons will not be graced or assisted by the presence of any engineers of the first rank—by any worthy successors of Stephenson and Locke, if there be such—but it will have a fair sprinkling of men more or less directly connected with the public works of private enterprise, and the great mechanical manufactories of the kingdom. Mr. Hawkshaw has not found the general election more favourable to the justifiable object of his ambition than the isolated contest in which the volunteer colonel was too popular for a great civil engineer. Mr. Bidder wisely thinks himself too old for the hothouse at Westminster, beside being utterly opposed to uncorrected reports of his unadorned eloquence. Mr. Fowler probably does not consider the time come for giving up underground London; and the other leading engineers prefer speaking as witnesses to speaking as senators. Mr. Gooch is, we believe, the only engineer pure and simple who has become a Member of Parliament. Sir Charles Bright, the knight made by the first Atlantic Telegraph, and the most solid monument of that sea-bubble, has improved on the fluke that pushed him so early to eminence amongst telegraphic engineers by winning Greenwich against a Scotch baronet of the oldest family. If the same fortune attends him in the House as out, we may see him, retired from business, resting thankful on the Treasury benches, or some still more lucrative office. The faith of those who put their trust in deep sea cables (we do not), will no doubt have a firm defender in Sir Charles Bright. Mr. Laird, of Birkenhead, who alone was able to criticize practically the shipbuilding efforts of the Admiralty, will have either an ally or a rival from the Thames in Mr. Samuda—that is, if Mr. Samuda can resist the syrens of the Admiralty, singing of contracts.

To certain minds, to reverse the maxim of Rochefoucauld, "there is something extremely disagreeable in the success of "our friends." Can Mr. Scott Russell, who has lectured and blessed almost every class of society, rest tranquil in his Sydenham retreat whilst a Thames shipbuilder takes up the seat and the place in Parliament which, in "his mind's eye," he had so often destined for himself? We are afraid that in the present aspect of politics Mr. Russell's chances are gone. There is no chance of our seeing the effect on the House of Commons of a style of eloquence in which the professor, the prophet, and the *petit maître* have a share in delivering anomalic truths on things in general, not always without wisdom and humour. To descend somewhat lower in the scale, at Banbury Cross Mr. Samuelson has brought his chaff-cutters and root-slicers to a good market, and will be the first representative of the comparatively new manufacture of agricultural implements; that is, if his Hamburg parentage does not stop him at the doors of the House of Commons. As Mr. Samuelson's star rises, that of Mr. Thomson, honorary editor-in-chief of the Agricultural Society's journal, sets, and he is driven from the representation of Whitby; yet he could be much better spared in the Council of the Royal Agricultural Society, where his amateur literary meddling has been most mischievous, than in the House of Commons, where he was a useful working member. The heir of the house of Brassey has been dispossessed of his short-lived honours at Devonport, and Mr. Betts, whose name is indelibly associated with railways, bridges, and docks all over the world, has not been more fortunate at Maidstone. He would have been a useful Opposition member, because thoroughly versed in the details of material and workmanship that have so large a share in the waste of our national resources. He could not, perhaps, have tackled Lord Clarence Paget in a set debate, but he would have been an awkward customer in a committee of investigation, and his prepared statements would have been full of matter and hard to break down. Mr. Kelk is best known to the general public as one of the contractors for Captain Fowke's Exhibition building. From his long experience as a builder on the largest scale, he must be able to say something useful as to the two commissionerships of Works and Buildings, and Woods and Forests, who do certainly manage to stop

the spigot and let out at the bunghole in a wonderful manner. The more able critic of the Woods and Forests, Mr. Caird, has just been silenced by a snug berth as Inclosure Commissioner. May his mantle descend on shoulders equally capable and more independent of the charms of £1500 a year. Mr. Kelk's election has been enlivened by a passage of not arms but writing between himself and Mr. Bidder, not uninteresting to the railway public. It seems, according to popular report, that a good deal of the Great Eastern shareholders money has been invested in Harwich, with no very great, if any, profit in a commercial sense—no perceptible return for harbour improvements, hotel, and steamboats carrying on a hazy traffic with the Continent—but greatly to the strengthening of the parliamentary interest of the Great Eastern, one of whose directors, Colonel Jarvis, has for some time been the representative of Harwich. The agents for the Steamboat Packet business have hitherto acted as the political agents of Colonel Jarvis and his party. For some reason or other, the Great Eastern Board determined while the election was pending to dismiss the old agents and appoint others not deep in politics. Mr. Kelk thereupon addressed a letter, partly of entreaties and partly of threats, to Mr. Bidder (he should have known his man better), to induce him to suspend the transfer of offices until the election was over. Mr. Bidder not being the sort of man to give way to compulsion, answered by sending copies of the correspondence to the rival candidate, Mr. Wills, who printed and circulated them. On the other side, Colonel Jarvis, with equal vigour, took a steamboat, went and met the Dutch mails, &c., and placed them in the hands of his agents, the ex-agents of the Great Eastern Company. The frolics of shareholders are usually confined to financial questions, and with this split at the board we may expect an early inquiry by the Great Eastern stockholders into the profits of the Harwich establishment.

Mr. Kelk, as a product of the South Kensington Exhibition, will be balanced on the other side of the House by the ponderous and perspiring gentleman—as the *Saturday Review* playfully describes him—who owes a baronetcy to the works which made Mr. Kelk famous at a considerable expense—Sir Wentworth Dilke! It would be difficult to point out any particular interest that Sir Wentworth at present represents, unless it be the Society of Arts and the *Athenæum*. Thus, while Berkshire rejects the principal proprietor of the *Times*, Wallingford accepts the proprietor of the *Athenæum*. "From the sublime to the ridiculous there is but a step." The most remarkable electioneering result is, perhaps, the return of a real tenant-farmer in the person of Mr. Clare Sewell Read for East Norfolk. Tenant-farmers were thought to have made extraordinary exertions when they returned as their candidate for Nottinghamshire an old wealthy retired attorney. Some years later they protested against Free Trade and the conversions of their old friends to Sir Robert Peel's new opinions by returning a farmer and Nonconformist preacher to vote back protection. But Mr. Ball was too old to learn a new trade, and never could get the House of Commons to listen to the repetition of a worn-out tune. Mr. Read is sent up as a protest against the malt-tax—he is in the prime of life, has made his local reputation as a writer and a speaker on agricultural, and not on political questions. His papers are amongst the best in the Royal Agricultural Society's journal, and if he can learn the tone of the House, which hates essays, there is really a place for him as the representative of tenant-farming feelings. On the other side, the great Squire Morritt, who brought on the malt-tax repeal question, in spite of his party, has been turned out of Yorkshire. We suppose the financial companies, which are supposed to be indispensable now for the floating of every great enterprise, may claim as their parliamentary produce the return of Mr. Albert Grant for the borough of Kidderminster. His address after election is a curiosity of English. His strength, no doubt, lies in arithmetic. Sir Morton Peto has shifted his seat from Finsbury to more distant Bristol. He will now be able to breakfast in peace, and will doubtless continue to throw the light of his experience on our fortifications and dockyards. Dudley has been faithful to its Sheridan. The insurance companies retain their able friend, and the new M.P. for South Lancashire will again meet the only speaker who ever had the best of him. Every newspaper has had its say on the success of literary celebrities in the metropolitan boroughs. According to rumour, the places of the illiterates rejected will be amply supplied from English and Irish boroughs. Altogether, the present Parliament will have more than a usual average of wealth, of literary talent, and practical knowledge.

The cholera which is now ravaging Egypt is a terrible addition to the trials under which that unhappy country is suffering. Egypt in misery is a sort of Oriental Ireland, and, curiously enough, only requiring two elements that Ireland has too much of—more labour and more water—in order to be the most productive agricultural country in the world. With capital laid out on intended works for irrigation, and enough hands to hoe every acre of alluvial soil, the produce and exportation of Egypt might be increased at least a hundredfold. The civil war in America gave a tremendous artificial stimulus to the cultivation of cotton. A murrain having swept away the cattle which used to draw ploughs as primitive as those figured on the bas-reliefs of Nineveh, the Viceroy introduced the steam-plough, and lifted the agriculture of Egypt at one stride from the most barbarous to the most refined system of cultivation. At this moment Egypt has more steam cultivators in use and abuse than all the continent of Europe together. The reigning Pacha has purchased 200, one of his ministers employs 30, and landowning personages connected with the Court all have one or more. For it has become the fashion to steam-cultivate the land in Egypt. A single farm of 10,000 acres is not uncommon. Courtiers show their devotion by imitating the Viceroy, who is the chief farmer and chief merchant of Egypt. The profits created by the new cotton trade were so large—the credit, a new thing to Orientals, being in proportion—that purchases were made on the most wildly lavish scale. A traveller for a great manufacturing firm describes his route through the cotton district last winter, as marked with the chimneys of portable steam-engines, sunk in the sand, like the furlong rods on a railway. Ignorant labourers and venal overseers soon brought a pumping or a cultivating steam-engine to grief. A screw loose was enough, and as mechanics were scarce, money was plentiful, and commissions to agents large, the common course was to abandon the damaged engine and purchase a new one from the stock at Alexandria, which was continually replenished from Europe. The fall in the price of cotton will damp credit and check the mad investments in machinery. The cholera will drive away the small number of European mechanics who have kept the steam-engines going, and still worse, decimate the unfortunate labourers, who with the rudest tools and with irrigating apparatus as old as the Pharaoh of Joseph and Potiphar, produce so much from the fat soil under a tropical sun. Egypt has been much under populated ever since it has been know to European commerce. The Government, with a false varnish of civilization, is the most wretched it is possible to imagine, far more than the careless, and sometimes cruel, despotism of other purely Oriental governments. The present rule has no personal taste for cruelty, and he has given up the playing at soldiers, to which his predecessor sacrificed so much money, so many lives, and so much useful labour. Avarice is his vice, and that is cultivated by the tenure of his Government. He is, to use a lawyer's term, a bare tenant for life, but "without impeachment of waste." He cannot name his successor, and has no object in improving the condition of the kingdom, which he rules absolutely; on the contrary, his object is to accumulate as much portable wealth as possible. He does not confiscate in the old rude Turkish mode—he finds that he can do better by monopolies and by forced labour. When his cotton wants gathering, he makes no scruples about impressing all the labourers on the estates nearest his own, and leaving the cotton there to waste and spoil. When he wishes to send his bales to market, he monopolizes all the boats or railway trucks; in fact, Oriental rapacity is stripped of bloodthirsty cruelty, and clothed in European garments. To make matters worse, the Viceroy is surrounded by European, or rather Levantine merchants, Greeks, or Greek-like, who make it a point to meet him on every possible occasion to congratulate His Royal Highness on this, that, or the other. H.R.H. the Pacha is a very affable, jovial fellow, although so fond of money. So his European friends first say all that is civil, and then, if they can, sell him a bargain. Few princes have a more extraordinary collection of bargains. Unfortunately, the wretched subjects have with "their vile bodies" to pay for these bargains. As if an essentially bad government was not curse enough for these miserable Egyptians, they are further afflicted by a French colony—M. De Lesseps and his Suez Canal scheme. As before observed, the chief want of Egypt, after security for person and property, is

labour to cultivate the rich, alluvial soil, and sow and reap the harvest which the Nile ensures, or may be made to ensure. Ten times the population could find profitable work in growing cotton, corn, flax, sugar, tobacco, and all the tropical and seminal agricultural produce; in fact, in productive agricultural work. But here steps in M. De Lesseps with a magnificent scheme that is, according to the promoters, to do wonderful things for Europe and Asia when completed! We will not stop to argue what would be the effect of a canal available for the largest merchant steamers. But in the meantime the Suez Canal Company have been at work six years, and have spent more than half their capital. Out of 84 million cubic yards to be moved, they have moved 14 million, and have employed every year by forced labour many thousand Arab labourers, who have during this time been taken from productive employment. The only real result so far has been the bringing fresh water by a shallow channel from the Nile to Suez. The fall in the price of cotton and the plague combined will hasten the crash which over trading and false credit have made certain. The only hope for the future of fertile Egypt lies in an understanding between England and France, which would give the reigning Viceroy a permanent interest in his kingdom's prosperity, and which would turn the labour of the French colony and their serfs from unproductive to productive works. Even cholera may work good if it draws attention to the suicidal system of government supported in Egypt by European influence.

Circular to Gas Companies.

The remarks in our last number on the conduct of the Phœnix Company, in threatening to discontinue the supply of gas to a customer unless their disputed claim for the previous quarter's supply was paid within three days from the date of the notice, have called forth some explanations, which place the matter in a somewhat different light from that in which it was presented in the letter of "E. H. M.," in the *Times*, which gave occasion to our observations. The writer is, we understand, one of the great Hebrew outfitters in the City, whose ability to pay any just demand on him is unquestioned. The meters by which the gas he consumes is measured were provided by himself, and they have recently been tested by an inspector appointed in accordance with the Act for regulating measures used in the sales of gas, and found to be correct. The increase in the quarter's consumption is accounted for by the fact that new mains of large dimensions have been recently laid, for the better supply of the district in question, in consequence of which the pressure has been considerably augmented, and as the heads of large establishments leave the regulation of the gas-burners in the hands of servants, who are careless in such matters, the effect of an increase of pressure in the mains is usually an increase in the quantity of gas consumed. It is to be regretted that these explanations were not courteously given in answer to the complaint first addressed to the company, or that they were not sent for insertion in the *Times* soon after the letter of "E. H. M." appeared. They tend to show there was no injustice in the demand of the Phœnix Company for payment of the quantity charged, but they do not, in our opinion, justify the threat to discontinue the supply on the mere expression of a doubt as to the accuracy of the registration of the meters, for which, without such explanations, there seemed good reason. There appears, however, to be so strong a disposition in some quarters to uphold the practice of discontinuing the supply, in preference to proceeding by action to recover a disputed gas account, that we have looked through the authorities on the subject to ascertain how far such a mode of enforcing payment is in accordance with law, putting out of consideration its impolicy and injustice.

So far as gas companies without statutory powers are concerned, the case of *Hazlewood v. the Hoddesden Gas Company*, has settled their right to discontinue the supply of gas at any time and for any reason. Such companies are in the condition of ordinary traders, and as they are under no legal obligation to supply gas to any one who may demand it, they are also at perfect liberty to discontinue the supply, if they can, whenever they please. In some cases, however, there have been difficulties in carrying their intentions into effect, from the want of authority to break open the pavement or roadway for the purpose of disconnecting the service-pipes; and there is one instance on record of a consumer setting a gas company at defiance, and threatening to indict them if they dared to break up the road, refusing, at the same time, to pay for the gas consumed, or to allow any access to his meter to ascertain the quantity registered. It is otherwise with gas companies incorporated by Act of Parliament. They are bound to supply gas on certain conditions to all who may require it, and the same obligation, it must be assumed, compels them to continue the supply when given, unless just cause be shown that the consumer is no longer in a condition to demand it. A gas company in whose special Act the Gas-Works Clauses Act of 1847 is incorporated, is, indeed, authorized by the 16th section of that General Act to stop the gas from entering the premises of any person who shall neglect to pay the rent due from him; and further to recover such rent, with the expenses of cutting off the gas, and the costs of the proceedings. That power is in some degree modified, so far as the metropolis is concerned, by the 21st section of the Metropolis Gas Act, which requires that three days notice in writing shall be given to a consumer who is in arrear, before discontinuing the supply. The same section provides that no contract shall contain any term or condition "for giving, in "case of difference, the sole arbitrament thereon to the gas "company, or any officer or person who is or has been em-"ployed by them, or who may have a pecuniary interest in "such company." In the case in question, "E.H.M." disputed the amount of the claim, and under this proviso he was entitled to have the judgment of some independent authority before he could be properly described as a person "in arrear," whose supply of gas might be discontinued. It may be urged that he might have paid the amount claimed and have sued the company for the overcharge; but in the case of *Ratcliffe v. the Burslem Gas Company*—though differing in some of the details from the one in question—it was laid down as a general rule of law that, if a person under no misapprehension as to facts pays a demand which could not be enforced, he cannot recover the amount, and the duresse or compulsion of stopping the supply of gas was held not to be insufficient to take the case out of the general rule applicable to such cases. It is clear, therefore, that the proper course which ought to have been adopted with "E. H. M." was, to have substantiated the claim and recovered the amount under the 66th section of the Phœnix Company's Act, which is amply sufficient for all such purposes, or to have recovered the amount by plaint in the county court. There are many instances in which the power of stopping the supply may be fairly enforced, but the case in question is certainly not one of them, and we should be glad to see the threat of having recourse to such an extreme measure expunged from the printed forms on which applications are made for the payment of the arrears of gas-rents.

Some doubt has been expressed whether a metropolitan gas consumer whose supply has been cut off for nonpayment of his account is entitled to demand a supply of gas under the 14th section of the Metropolis gas Act. The only question that in our opinion can be raised on the point is, whether premises from which the supply has been cut off, are premises "not "already supplied with gas;" for if not already supplied the owner or occupier is entitled to demand a supply, and if the company fail to provide it for seven days after having been requested in writing so to do, when no security for payment has been required, or for fourteen days when security has been required and given, they are liable to a penalty of 40s. for every day during which the failure continues. We apprehend that if the supply of gas to "E. H. M." had been discontinued, his premises would have been held not to be "already supplied with gas," and that he would have been entitled to demand a supply within the time specified. If that be a correct interpretation of the Act, the threat to cut off the supply of gas is mere *brutum fulmen*, that may exasperate and create enemies, but is of little avail in compelling refractory customers to pay. Whatever may be the legal construction given to that section of the Metropolis Gas Act, we feel assured that it is the interest of all gas companies, provincial as well as metropolitan, to put liberal interpretations on the wording of their several Acts, and when any doubt exists as to the meaning of any provisions to give the public the benefit of the doubt. It is still more essential that they should not insist on any obnoxious regulations which are not expressly warranted, and that they should be careful in their transactions with their customers to avoid giving offence by imperious conduct that would not be tolerated in ordinary tradesmen. It is only by liberal and courteous dealing that

the gas companies can maintain their ground against the organized movement which is in operation to ruin them.

A case of much importance to those gas companies who are under the obligations imposed by the Gas-Works Clauses Act, came before the Lancashire Quarter Sessions at Salford on the 5th inst., on the application of the Ashton Gas Consumers Association, having for its object a reduction in the price of gas, in consequence of the maximum prescribed dividend of 10 per cent. having been paid to the shareholders of the gas company since their incorporation in 1847, and the reserved fund having been, as alleged, completed. At a previous quarter sessions an accountant had been appointed to examine the accounts of the company, and from his report it appeared that the full dividend of 10 per cent. per annum, without deducting income-tax, had been paid to the shareholders since 1847; that a "reserve-fund," amounting to £3672. 3s. 6½d., and a "contingent and renewal fund," amounting to £5700, had been accumulated; and that the income-tax paid in addition to the dividends amounted to £2513. These sums, together with £600 for interest on the amount of the income-tax—which it was contended by the counsel for the applicants should have been deducted from the dividends—and £500 which had been added to the contingent-fund, or expended in extensions since the accounts were made up, from a total of £12,985, and as the company are authorized by the Gas-Works Clauses Act to accumulate a reserve-fund of only £4000, it was alleged that the clear surplus profits amounted to £8985, and that a reduction in the price of gas should be made equal to 1s. per 1000 feet. The bench, after a prolonged discussion, expressed an opinion unfavourable to the practice of paying the income-tax in addition to the 10 per cent. dividend, but on the main question, whether a contingent-fund under the Companies Clauses Act could be formed in addition to a reserve-fund under the Gas-Works Clauses Act, they expressed no opinion, as it did not come within their jurisdiction, though it was evident they thought it reasonable. One of the magistrates, the late chairman, observed that the Gas-Works Clauses Act only enabled them to reduce the price of gas, when it was proved that the full amount of the reserve-fund had been invested, and as the money had not been invested, and as they could not order moneys that had been improperly expended to be refunded, they could not interfere. They ultimately decided that no case had been made out to justify an order for the reduction of the price of gas, but the gas company were ordered to pay the costs of the application. It appeared from the accounts that the reserve-fund had not been invested in Government or other securities, as required by the Gas-Works Clauses Act, but that it had been employed in extending the works, while the contingent-fund of £6200 had been written off the expenditure on works. The plea advanced by the counsel for the gas company, that by this malfeasance on their part the magistrates were technically prevented from acting in the matter, is strongly commented on in a local paper, which urges the gas consumers not to relax their efforts, but to insist on obtaining justice, either from the Town Council, the Court of Chancery, or Parliament.

It is fortunate for the Ashton Gas Company that their case was adjudicated by a tribunal that took a common-sense rather than a strictly legal view of the matter, for there can be no question that the payment of income-tax in addition to the maximum prescribed dividend, is a violation of the Income-Tax Act, and that the contingent-fund authorized by the Companies Clauses Act should be provided out of the prescribed dividend, and not in addition to it. The result of this case is not such as to encourage other companies under the Gas-Works Clauses Act to pursue a similar course to that adopted by the Ashton Gas Company. The application failed on technical points, which would most probably have been decided against them in a superior court; and it ought to be borne in mind that should such an application be successful, and the price of gas should be reduced by order of Quarter Sessions, it is doubtful whether it could be raised again should the price be found insufficient to pay the prescribed dividend.

We have much satisfaction in congratulating gas companies in general on the election of Joseph Cowen, Esq., as representative of Newcastle-upon-Tyne—a gentleman who is eminently qualified to advocate their interests in Parliament. Mr. Cowen is a practical man, who thoroughly understands all questions relating to the manufacture and supply of gas, having himself established gas-works for lighting his manufactory and the town of Blaydon-upon-Tyne. He is one of those highly meritorious men who have risen from the ranks, by their own abilities and perseverance, to the highest position of our English gentleman. We reprint in another column, from a local paper, a well-merited eulogium of Mr. Cowen, mentioning his career in life, and the high estimation in which he is held by all who know him. He was returned at the head of the poll.

A correspondent requests us to ascertain the title of any work published in England in which testing the soundness of gas-fittings by means of an air-pump and pressure-gauge is described. We have some recollection of seeing it mentioned many years since, when the apparatus was first introduced, and we shall feel obliged to any of our readers who will send us the title of the work, and state where it can be procured.

Mr. Sugg has rendered a valuable service to managers of gas-works and others who interest themselves in testing gas for sulphur, by the publication of a series of tables which show at a glance the quantity of sulphur present in 100 cubic feet by the combustion of from 10 to 30 feet, and by the collection on the filter of any quantity of sulphate of baryta, from 1 to 67 grains. By these tables the necessity of all calculations of relative quantities is avoided.

The town of Ross, in Herefordshire, has for many years past figured in our list of towns in which gas was supplied by the local authorities; but, from some cause or other, the works have recently passed into private hands, and the Improvement Commissioners have ceased to have any control over the manufacture and supply of gas. We have, on several occasions, had to notice the disastrous state of several gas affairs when under the management of local authorities, but this is, we believe, the only instance in which any of those bodies have actually transferred the works and acknowledged that the supply of gas can be better managed by private enterprise.

The contest which has for some years past been carried on between the two gas companies at Whitehaven has terminated, as all such contests invariably do, by an arrangement between the two companies, by which the price is raised to 3s. 4d. per 1000 feet to all who consume less than 75,000 cubic feet per annum, and to 3s. for larger quantities. The old company have hitherto charged 2s., at which rate they paid a small dividend, and the new company charged 2s. 6d., but paid no dividend, and the exhaustion of the latter appears to have been the chief cause for the arrangement which has been entered into between them. Whitehaven consequently disappears from Mr. Flintoff's catalogue of towns in which gas is supplied at low prices, leaving Plymouth, with its gas at 2s. 9d., the lowest on the list.

Communicated Article.

(*All articles inserted under this head being copyright, the right of reproduction or translation is reserved.*)

EXPERIMENTS ON THE ACTION OF THE SULPHIDES OF AMMONIUM UPON THE BISULPHIDE OF CARBON AND SULPHURETTED HYDROCARBONS IN COAL GAS.

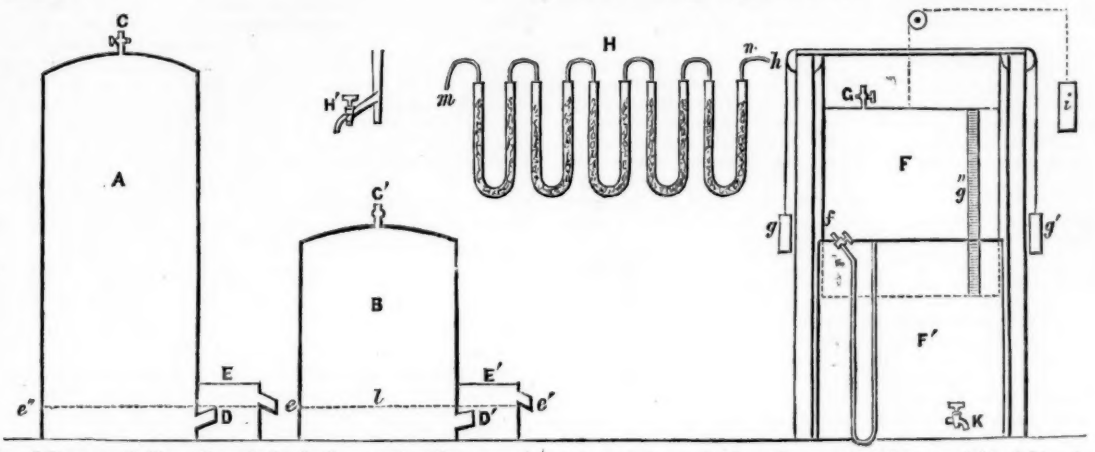
By Alfred George Anderson, Esq.,
Professor of Chemistry in Queen's College, Birmingham.

More than two years ago, while making experiments in a gas-work, I was led to the conclusion that occasionally the sulphur impurities, other than the sulphuretted hydrogen, of the coal gas underwent partial removal in the condensers, purifiers, or some part of the apparatus lying between the retorts and gasholders. Repeated analyses at this time showed a singular fluctuation in the proportions of bisulphide of carbon and the doubtfully constituted hydrocarbon sulphides, always, however, present in more or less quantity. Thus, upon one occasion, the amount of sulphur existing in this state of combination, calculated for 100 cubic feet, was 17·1 grains; six hours after the quantity proved to be 11·16 grains; and a third examination gave 14·88 grains. During the whole period these experiments were in progress, continuous regular working was maintained as much as possible, and an efficient "scrubber," well supplied with the ammoniacal liquor produced upon the works, was in steady action. Later on, my impressions upon this point became almost convictions, from finding that the coal used in my experiments was of a kind to contaminate its ordinarily purified gas with from 22 to 26 grains of sulphur. Since making these experiments, I have been anxious to solve the important questions—Are these sulphur compounds retained by contact with any substances as they pass on their way to the gasholders? or is the occasional considerable variation in their pro-

portion due to the possible fluctuation at times in the quantity of pyritical sulphur present in the charges of coal, to which last metallic bisulphide, it would seem, is to be ascribed their production at all?

To clear up the great uncertainty still existing upon this very important point, the following experiments have been made:—

It is essential, in the first place, to describe the apparatus, of which a drawing is appended below.



A and B are gasholders of precisely similar construction, except that the vessel A has twice the capacity of B. They are both furnished with stop-cocks, of the best make, at C C′; they have also outlets at the lower parts, D D′; the projecting parts, E E′, are small square tanks, into which outlets, *e e′*, are soldered, and which may be closed at any time by corks. These outlets *e e′*, it should be observed, are so situated that, supposing the stop-cocks C C′ were opened, and water poured into the tanks E E′, after overflow at the outlets *e e′*, the uniform level of the water in the vessels A and B and the tanks E E′ would be preserved about three-quarters of an inch above the outlets D D′.

F is a gasholder capable of containing about 3 cubic feet of gas, graduated at *g″*, to enable its volume of gas to be known, and of which construction some account has been given in my former communications to this JOURNAL. It is necessary, however, to give a short description once more, in this place. A glance will show that it is of the usual form, standing in the water-tank, F′, with tube for passing gas into the interior, *f*, and counterbalance pulleys and weights at *g g′* and *h h′*; it has a stop-cock soldered into the upper part of the gasholder, at the position shown by G; at H is shown an arrangement of five U-tubes, 9 inches long and ¾ inch internal diameter. These were filled with pieces of broken pumice; but a further description of the purpose for which they were employed is deferred for a short time. It is as well to remark here, that the capacity of the gasholder B exceeded that of the gasholder F by about one-sixth. At H′ is a water-tap, with a head of water supplied from the highest level of the Queen's College.

With the completion of this arrangement, a small iron retort, capable of distilling 6000 grains of coal, was heated to redness, charged with common bituminous coal sufficient to fill the gasholder F. Great care was taken to completely remove every trace of sulphuretted hydrogen from it, by transmission through an adequate quantity of hydrated sesquioxide of iron, mixed with sawdust. Simultaneously with filling the gasholder F with this gas, the gasholder A was filled with water from the tap H′, by joining it with a tube of flexible india-rubber to a perforated cork, fitted with a tube capable of forming an air-tight connexion into the inlet D, and then opening the stop-cock C. When water flowed uninterruptedly from this tap, it was turned off; sufficient water was poured into the tank E, to allow it to overflow by the outlet, *e*; the cork and tube junction was then removed from the outlet D, and in this way it is obvious the gasholder A was maintained perfectly filled with water until wanted for another purpose, by the pressure of the atmosphere. When the gasholder F was filled with the coal gas, the stop-cock *f* was turned off. The stop-cock G was connected by a tube with the stop-cock C in gasholder A, and a few weights were placed on the top of the gasholder F; the cock G was then turned on, and a steady transfer of gas was immediately induced from the gasholder F to the gasholder A when the stop-cock C was likewise cautiously turned on, thus causing a flow of water from the gasholder A to pass out by the orifices D *e*. As soon as the whole of the gas had been thus transferred, the stop-cocks C and G were turned off, and a second charge of coal was worked off, similarly to the preceding one; the conveyance from the gasholder F to the gasholder A repeated until sufficient was stored in the latter, for the purpose of the experiments to be described further on. After allowing 24 hours for diffusion, some of this gas was transferred back to the gasholder F in the following manner:—The gasholder F was completely filled with the water of the tank F′, by opening the stop-cock G, and allowing it to sink completely beneath the surface of the water, by removing the weights *h h′*.

The stop-cock G was then turned off, and care was taken to ensure the filling of the tube connected with the stop-cock *f* with water. Then the stop-cock C was joined by a tube with the stop-cock *f* of the gasholder: the counterbalance weights *h h′* restored to their original position, and the stop-cock H′ connected as before, by attaching it to the inlet D of the gasholder A, taking care, however, to completely fill its tube with water, by turning on the tap H′, after immersing the lower end beneath the surface of the water in the tank E, before making this junction. A little water was then allowed to run from the tank F′, by turning on the tap *f*, so as to allow the level of the water in the tank F′ to stand a little below the height of the immersed gasholder, F. When the stop-cock H′ was turned on, from which the water immediately flowed into the lower part of the gasholder A, inducing considerable compression of its gas, the stop-cock C was opened, and after atmospheric air had been expelled from the junction-pipe, by momentarily removing it from its connexion with the tap *f*, it was again joined to that tap, which was immediately opened, and the flow of water continued into the gasholder A, until sufficient gas had been transferred into the graduated gasholder, F. Then the stop-cocks C H′ were both shut, the cork and tube removed from the inlet D, which was in the first place covered by some water in the tank E, and thus the gas was preserved for a second experiment, in a perfectly uniform state with that taken for the experiment now to be detailed:—

Gas was now allowed to flow out, by opening the tap G, until exactly 2½ feet remained in the gasholder F; a thermometer, suspended in very close proximity, marking at the time of this reading a temperature of 64° Fahr. The second gasholder, B, which it has been before observed, and as will be seen on referring to the drawing, precisely resembled the larger gasholder, A, had been prepared for the next operation by being completely filled with water, by joining the tap H′ with the inlet D′, opening the tap C′, &c., &c. Then the stop-cock *f* being turned off, the measured gas was again transferred from the gasholder F by weighting it, connecting its interior with that of B, allowing the water to float out at D′, &c., &c. When the gas had been completely transferred from the vessel F, the stop-cock G was turned off, and the small quantity of gas remaining in the connecting-tube was swept into the gasholder B by the pressure of its column of water, together with a little atmospheric air, by suddenly releasing it from its connexion at the stop-cock G; after which the stop-cock C′ was turned off. The next intention was to subject this measured volume of gas to the action of sulphide of ammonium. To effect this, the first four U-tubes nearest to the gasholder B were charged with the strongest liquid ammonia, well saturated with sulphuretted hydrogen, until the liquid remained in all the tubes at a height of 2 inches, the pieces of pumice being at the same time well saturated with the same solution. The fifth and last tube was filled to the same height, and the pumice similarly saturated with a solution of carbonate of ammonium obtained by dissolving one part of ordinary sesqui-carbonate in four parts of water, to which one fourth of strong solution of ammonia had been added. This arrangement, H, terminated with two double-necked Woolfe's bottles attached to the tube *n* (not shown in the drawing), filled with hydrated sesquioxide of iron, to remove any trace of sulphuretted hydrogen, and so prevent the possibility of its passing with the current of gas into the receiver. The stop-cock C′ was then connected by a glass tube with the end *m* of the arrangement of tubes, H, and the last Woolfe bottle continuing the series from the tube *n* was joined to the inlet *f* of the gasholder F (previously, as before, filled with water by the pressure, and in readiness for refilling with gas), and a steady flow of gas made to pass through the tube series, by the compressing influence exercised as before, by the column of water impelled from the tap H′ into the opening D′. Great care had been taken to ensure perfectly sound joints in all the connections, so that not a leaky place could be discovered, during the whole

progress of the operation. The gas was found, at the commencement of the experiment, to be quite free from sulphuretted hydrogen,* for, at the commencement of the operation, a piece of moistened carbonate of lead was placed at the lower part of the glass tube joined to the tap C′, and remained quite unaltered in colour. When the whole of the gas had been expelled from the gasholder B, as proved by the rising of water in the glass tube above C′, a gas bottle, evolving a considerable volume of hydrogen (obtained from very pure diluted sulphuric acid and zinc), was quickly connected at the position *m* of the tube connector so that the gas remaining in the U-tubes, should be finally driven into the gasholder F. When this was thoroughly accomplished, the stop-cock *f* was shut off, and the tube arrangements disconnected. To determine the quantity of sulphur in the form of sulphide of carbon, or in an analogous state, the apparatus employed was that of which a description has been given in the *Chemical News*, by Dr. Letheby, with the exception that two capacious receivers, each containing 1½ fluid ounces of strongest solution of ammonia, (absolutely free from any trace of sulphuric acid), were employed to absorb the condensable products. When the 2½ feet of gas at 64° Fahr. had been burned in this apparatus, with the greatest possible care, the products were poured into a glass beaker, and, with the distilled water rinsings, treated with a current of pure chlorine and the solution filtered.

Chloride of barium solution was then added, and after a few minutes agitation a precipitate formed; this was allowed 24 hours rest, in order to effect complete subsidence. The weight of the sulphate of barium obtained will be given in a tabulated form presently, when comparing together the various results.

A transfer was now effected of another portion of the gas contained in the store gasholder, A, to the gasholder F, the intention being to determine the quantity of sulphur contained as bisulphide of carbon, &c., in exactly 2½ feet of the gas, but *without* exposing it to the action of the sulphide of ammonium, &c. This was in its turn effected by the described method, and when 2½ feet had been accurately measured at the corresponding temperature, its combustion was performed with a precisely similar arrangement, quantities of ammonia, &c., as in the first instance. The proportion of sulphur ascertained in this trial we will designate as experiment B. For experiments C and D two fresh quantities of gas were prepared from another sort of coal, collected in the large gasholder, as in the previous instances, allowed to diffuse, and 2½ feet once more measured off with precision. This portion, which must be called experiment C, was not exposed to the action of the sulphide, &c. Experiment D—the last at present undertaken with coal gas—was made with all the additional excellence of more slow and regular transmission which the experience of the first trial had placed at my command.

The table below places the results of the four experiments so that they may be understood at a glance:—

Table showing the quantity of Sulphur in the form of Bisulphide of Carbon or Sulphuretted Hydrocarbons in Coal Gas, with and without exposure to the action of Sulphides of Ammonium:—

FIRST QUANTITY OF GAS.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphides of Ammonium or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
A	2½ c. feet.	Yes.	1·20 gr.	6·59 gr.
B	2½ c. feet.	No.	2·62 gr.	14·39 gr.

SECOND QUANTITY OF GAS.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphides of Ammonium or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
C	2½ c. feet.	No.	2·33 gr.	12·80 gr.†
D	2½ c. feet.	Yes.	0·30 gr.	1·64 gr.

The next experiment has an important confirmatory bearing on the results obtained with coal gas. The large gasholder A was filled with water, and the delivery-tube from a capacious flask, generating very pure hydrogen, from the purest zinc and diluted sulphuric acid, was placed well into its orifice D, while the water-level remained at the line *e*, thus covering the orifice D, while flowing out of the opening *e*, as displacement by the hydrogen took place. Soon after the generation of this hydrogen, a stopped U-tube was counterpoised in a balance, a few drops of bisulphide of carbon poured into it, and the tube and contents again weighed; an increase of 1·70 grains was noted. Whilst a brisk evolution of hydrogen was maintained, the stoppers from this U-tube were removed, and by making it a connecting-tube between the hydrogen generator and the tube in the orifice D of the gasholder A (to which it was first attached), the whole of the bisulphide of carbon was by this means immediately carried into the gasholder, where, after completely filling it with hydrogen, it was allowed to diffuse for 24 hours; 2½ cubic feet of this hydrogen thus impregnated with the bisulphide of carbon were then driven by the described method from the gasholder A to the gasholder F, and the temperature, as usual, noted at the time of measurement. As with all the experiments, precisely the same apparatus was employed for the combustion of the measured quantity of gas for the determination of its sulphur, with the addition of ammonia solution to both the receiving vessels. This first analysis of the bisulphurized gas shall be called experiment E.

Experiment F is that in which another 2½ cubic feet, temperature 64°, was, after transference from the gasholder A to the gasholder F, once more accurately measured there; then, in the usual routine, it was conveyed to the gasholder B, subjected to the rinsing agitation of fresh sulphide of ammonia—which, it may be mentioned, was observed in every experiment—in the U-tubes; and finally collected as before in the gasholder F. The precipitation of the two solutions resulting from the experiments E and F, by chloride of barium, after the oxidation by chlorine, terminates the series of experiments undertaken upon these points up to the present time. The results obtained in these last two examinations are stated in the table below:—

Results of the action of Sulphides of Ammonium upon pure Hydrogen Gas impregnated with Bisulphide of Carbon:—

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphides of Ammonium or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
E	2½ c. feet.	No.	2·57 gr.	14·11 gr.
F	2½ c. feet.	Yes.	1·01 gr.	5·54 gr.

Hence we may consider it as established that, provided coal gas be brought into ample contact with ammoniacal sulphides, its sulphuretted compounds, hitherto deemed so difficult of removal, may be absorbed by such means in a greater or less degree. The experiments C and D, where we have the quantity 12·8 grs. diminished by this scrubbing operation to 1·64 grs. in 100 cubic feet, would appear to point at the probability of their removal altogether being attainable, provided that an adequate amount of sulphide and surface be arranged for that purpose. The results of many other experiments still in progress on the subject will, it is hoped, be ready for publication in the next JOURNAL OF GAS LIGHTING.

* This test was carefully applied at the commencement of every experiment.

† A little of the precipitate was lost in this analysis, so that the quantity of sulphur was really somewhat higher.

IMPORT DUTIES ON GAS APPARATUS IN AUSTRIA.

The barrier of prejudice against the principles of free trade which has hitherto excluded, or greatly obstructed, the influx of foreign manufactures into Austria has been assailed, and there is some hope that it may be, partially at least, broken down by the facts and arguments that are now being brought to bear against it. In few countries has a restrictive policy been more rigidly adhered to than in the Austrian empire, and it is commonly assumed that the autocratic form of Government has been the principal cause of that policy; but, in reality, the strongest opposition to the introduction of foreign manufactures into any country has generally arisen from the manufacturing classes. With the produce of the soil, indeed, it is different. It is with the landed proprietors that foreigners in that case come into competition; and the obstinate resistance of the autocracy of this country to the abolition of the corn laws is a striking example that even the best educated class are opposed to free-trade principles, when they threaten to militate against their interest. We need not, therefore, be surprised that a similar feeling should prevail among manufacturers and artisans when attempts are made to introduce foreign articles, which, being more artistically or more cheaply produced, will, they fear, ruin their trade and throw them out of work. Though no country in the world has less cause to fear the rivalry of foreigners than England, in most branches of manufactures, yet we all know with what energy and persistence reductions of import duties were resisted on those articles in the making of which they were known to excel us. Experience has in our case shown the impolicy of relying on protective duties. The apprehended injury from foreign rivalry was found to be greatly exaggerated, and the effect of competition has been, in many cases, to improve the home manufactures, so as to enable them to meet foreign productions fairly in the market; while the commercial prosperity of the country has prodigiously increased by the influence of free trade principles. France, under the iron rule of the Emperor, was obliged reluctantly to follow the example of this country, and she also has reaped nearly corresponding benefit. The Austrian Government are now making an effort to do the same. A commission of inquiry has been appointed, and is still sitting, at Vienna, to receive evidence as to the probable effects of adopting a more liberal commercial policy. Several deputations from bodies of English manufacturers, who are specially interested in the reduction of the Austrian tariff, have proceeded to Vienna to give evidence in proof of the advantages that would attend the reduction of the almost prohibitive duties that are now imposed on the importation of their goods.

We are induced to notice the subject, in consequence of the report recently presented to a meeting at Birmingham of gas and boiler-tube makers, chandelier manufacturers, and others, by Mr. W. H. M. Blews, who visited Vienna as a delegate from those branches of manufacture. When in Vienna, he had the opportunity of conversing with several of the ministers and other official persons, and he states in his report that he was highly gratified to find how general is the belief that the adoption of more liberal commercial principles is essential to the progress of Austria, and that the Government are far in advance in their appreciation of the principles of a free-trade policy of the members of the lower

chamber of the Legislature. With regard to the manufacturing interests which Mr. Blews specially represented, he was enabled to make out a strong case in favour of the relaxation of the existing duties. There are in Austria only two manufacturers of iron gas-tubes, and their producing capabilities are so limited that the demand for gas tubing could not be supplied without foreign aid.

As an illustrative instance, it is stated that a parcel of gas-tubes having been required within a short time, the Austrian manufacturers were applied to, to ascertain when they could supply them. One of the two makers declined to guarantee the delivery within any specified time, and the other required four months. The result was that the tubes were ordered in England, and were delivered in Vienna within seven weeks, though six weeks were occupied in their transit. To show how seriously the high import duties affect the interests of gas lighting in Austria, it is stated, on the authority of the Imperial Continental Gas Company at Vienna, that on an invoice value of 91,639 florins of gas tubing, the duty amounted to 67,119 florins, or 75 per cent., and the carriage to 30,071 florins; and on 5 cwts. of brass tubing, that cost at Hull 11d. per pound, the duty and the charges are so heavy, that the selling price at Vienna amounted to from 2s. to 2s. 3d. It is computed that the duties paid on the materials imported for the gas-works in that capital since their establishment have amounted to upwards of £200,000. To compensate for this heavy impost, the company have been obliged to charge more for the gas they supply, and that of course has checked the consumption. There has, consequently, been so little inducement to individuals to burn gas, that though the works in Vienna have been established 20 years, not one private house, previous to the present year, had been lighted with gas. Nothing could more strikingly show the impolicy of the restrictive system of Austria than its depressing effect on a means of illumination, the advantages of which are elsewhere so generally appreciated, and there can be little doubt that in other branches of trade besides those represented by Mr. Blews, equally convincing proofs might be adduced before the commission of inquiry of the necessity of adopting a more liberal commercial system in that country.

Correspondence.

ANDERSON'S RETORT SETTINGS.

SIR,—The answer which you gave to your Canterbury correspondent on the 27th of June last regarding my system of retort setting is calculated to injure me, and it is not correct.

For one or other of these reasons I am sure you will have the goodness to publish the accompanying correspondence, which proves that my system is applicable for small as well as for large works.

GEORGE ANDERSON.

16, *Adam Street, Strand, London, W.C.*,
July 19, 1865.

16, *Adam Street, Adelphi, London, July* 11, 1865.

Dear Sir,—Possibly you have noticed in the JOURNAL OF GAS LIGHTING of the 27th ult. a statement made by the editor, in answer to a correspondent concerning my system of retort setting, that "it was applicable only to very large works, where 15 or 20 retorts can be set in operation or thrown out of use at the same time."

I find I remodelled your works in 1860, and as they cannot by any means be classed as "large," I will feel obliged, therefore, if you do not object to state, with a view to publication, how you have found the system to work, and with what results.

GEORGE ANDERSON.

To Michael Kearney, Esq., Engineer, Gas-Works, Clonmel.

Clonmel Gas-Works, July 13, 1865.

Dear Sir,—I beg to acknowledge yours of the 11th, and desire to say in answer that I did notice the paragraph to which you refer, and have no objection to state that in 1860 you erected at these works a setting of 18 retorts—that is, 6 retorts in each of three arches, with flues and dampers so arranged that all could be heated together with one coke and one tar fire, or 6 could be detached and heated alone. In addition to this triplicate, as it is called, you erected a setting of 9 retorts in one arch heated by one fire.

By this means you enable l us to work 6, or 9, or 15, or 18 retorts at a time, according to the season, and I have found it an easy enough gradation for a manufacture such as ours—say 1500 tons annually; making about half a million feet in the month of June, and nearly 2 millions in the month of December.

Our carbonizing returns are perhaps the best evidence of the value of your system, taking the average of the four years previous and the four years subsequent to its introduction here. The sale of residuals yielded us then 38 per cent. of the cost of the coal; they yield us now 64 per cent., the quality of coal being the same (Ravensworth Pelaw)—the price and quantity nearly the same. Prior to 1860, we used to have about 5½ cwt. of coke left for sale; we now have 10½ cwt. nearly, so low has our fuel account become since we made the change.

Settings such as you have introduced here may fairly be calculated to last four years. The bed of 9 retorts above alluded to is still in good order, having worked for about 30 months off and on since 1860.

M. KEARNEY.

[We cheerfully insert the above, and are glad to find that greater success has attended the adoption of the system at Clonmel than followed its adoption in Bastia, where, we understand, it has been abandoned.—ED. J. G. L.]

Register of New Patents.

2189.—ADDISON MOE, of Milwaukie, in the co. of Milwaukie, State of Wisconsin, U.S.A., for "*An improved construction of double-action submerged force-pumps.*" Provisional protection only obtained. Dated Sept. 8, 1864.

In the pump-cylinder is placed a hollow piston, with a tubular piston-rod. Upon one side of the pump-cylinder is a vertical water-passage, communicating at one end with the upper part of the pump-cylinder, and at the other with a horizontal passage under the said cylinder. Between the bottom of the pump-cylinder and the top of the horizontal passage is a suction-passage, open at one end to the surrounding medium, and communicating with both the pump-cylinder and the said horizontal passage by an opening in the bottom of the one and the top of the other, the said openings being in a vertical line. To cover and uncover these openings a double puppet-valve is employed. The stem of this valve passes upward through the suction-passage into the pump-cylinder, and downward into the said horizontal passage. Upon either end of this stem is a circular plate, the upper end of which works over the opening in the bottom of the pump-cylinder, and the lower one over the opening in the top of the horizontal passage. Within the hollow piston, near the side adjacent to the vertical passage, is a valve reaching nearly from top to bottom of the said piston. This valve has a tubular aperture extending nearly its whole length. This aperture is placed over the vertical rod, the latter being fixed to a bridge below the valve-seat, passing across an opening formed in the bottom of the piston. In the top of the piston is a corresponding opening. The valve plays up and down upon the said vertical rod, closing these openings alternately.

2194.—THOMAS TAYLOR, of 4, Euston Grove, in the co. of Middlesex, for "*Improvements in urinals.*" Patent dated Sept. 8, 1864.

This invention consists in the construction of urinals for railway-stations, and consists of a series of cells or openings, having a trough extending the whole length of the series, in the front of which trough projecting channels are formed, one in each cell or compartment. Water is constantly supplied at one end of the trough, and flows through its whole length, and then away by a suitable outlet at the other end; or it may be introduced through the bottom in each compartment.

2228.—ALONZO GALORD GRANT, of the Long Row, Nottingham, photographist, for "*A clockwork magnesium lamp, with reflectors, magnifiers, and condensers, for the burning of magnesium wire to produce powerful light.*" Patent dated Sept. 12, 1864.

This invention consists of a clock-lamp for the combustion of magnesium wire to give a constant light. The wire is wound on spools, and one or more of the spools are placed in a cylinder, with a slot in the band, the cylinder being fast to the handle, with a cap on the front, so as to allow the spools to unwind. The wire is passed through the slot in the band of the cylinder, and thence through the flat conducting-tube to two rollers driven by clockwork, which can be regulated to run the required speed, according to circumstances and to the rate of combustion. After the wire or wires leaves the rollers, it enters another tube of cork or metal, which conducts the wire through the reflectors, or to the point where the centre of light is required.

2237.—ZOHETH SHERMAN DURFEE, of Pittsburgh, Pennsylvania, U.S.A., engineer, for "*Improvements in apparatus for generating gas for fuel, and in furnaces for applying gaseous fuel to metallurgical and other operations.*" Patent dated Sept. 13, 1864.

The gas-generator consists of a chamber, of any convenient section, provided with a grating at its bottom, which it is preferred to make considerably smaller than the sectional area of the chamber; also to build it on one side of the axis of the chamber. In such case the walls of the chamber are made to incline towards the grate, from a sufficient height to permit of the ready descent of the coal thereto. This generator is fed with fuel from its top, which is covered with a plate of iron or other suitable material, fitting practically air-tight, and carrying the apparatus for feeding the generator. The cover or top is made to revolve by suitable appliances, so that one feeding apparatus may be made to supply the whole area of the generator regularly and efficiently. The feeding apparatus is made so that its bottom opens and delivers out the fuel, then closes automatically during the movement of the revolving top. At the top of the generator, supported by brackets projecting inwards from the walls thereof, is suspended an open-mouthed vessel of any convenient section, but so much smaller than the generator as to allow of a good supply of fuel being maintained between it and the walls of the generator. This vessel, which is somewhat similar in construction to arrangements already in use at the mouths of blast-furnaces, is for collecting the gases evolved in the main chamber. It has pipes at or near its top, leading out through the walls of the generator, for carrying off the gases. The said vessel reaches as far towards the grate as is convenient, the distance being regulated by the general proportions of the generator. The walls of the vessel, from its mouth towards the top, to a height somewhat below that at which the fuel in the generator is generally maintained, are perforated with a number of holes, tapering outwards for the purpose of drawing off the gases from the surrounding fuel as rapidly as they are generated, and to assist in preventing the clogging of the generator by accumulation of tarry matters therefrom. Around the walls of the generator is constructed a series of flues, winding in a spiral direction from top to bottom of the generator, or *vice versâ*, so that the waste products of combustion from the furnace in which the gases made in the generator are burned may pass round the generator, and communicate their heat through its walls, which are thin, to the fuel therein, and assist in its decomposition. On the outside of these flues, which are of a size corresponding to the requirements of the furnace whose outlet they are, is sometimes arranged a casing of sheet or cast iron, as a boiler or heater of water for a boiler, so that as much as possible of the heat of the waste products of combustion referred to may be utilized. Combustion is maintained in the generator to the extent necessary for furnishing the requisite quantity and quality of gases, and may be so managed, either by draught or blast, or by either of these methods, aided by the partial exhaustion produced by the operation of the furnace.

In the furnace for burning the gases made in the generator, a series of perforated diaphragms is used in the brick-work of the top or sides, or enclosed in casings or segments of iron or other material, which are built into or made to constitute the top or sides of such furnace.

2238.—Samuel John Taylor, of West Bromwich, in the co. of Stafford, mechanic, for "*Improvements in the manufacture of iron hollow ware; which improvements are also applicable to the manufacture of iron pipes and other articles made of iron.*" Provisional protection only obtained. Dated Sept. 13, 1864.

This invention consists of certain improvements whereby the surface to be coated with tin, or with glass or enamel, is made of wrought iron, which said wrought-iron surface is attached to and strengthened by cast iron, which composes the greater part of the article.

2259.—Joseph Raphael Cafferata, of Liverpool, in the co. of Lancaster, for "*Improvements in gaseliers.*" Provisional Protection only obtained. Dated Sept. 16, 1864.

This invention consists in certain mechanical arrangements to prevent accidents through the sudden falling down of the gaseliers through the breaking of the balance-chains from rottenness or other causes. To accomplish this object, a frame is employed, hereinafter termed the catch-frame, which may be made of brass, iron, or other suitable metal, the same being perforated with a hole of the same diameter as the inner tube, and fastened by screws or rivets, or otherwise securely attached to the cup-shaped top of the outer tube to which the balance-chains are usually attached. The catch-frame contains a hollow slit, within which are two clips or catches, one at each side of the inner pipe, made of brass, iron, or other suitable metal, which are continually pressed towards each other, and so grasp or hold the inner gas-pipe by means of two steel springs, the said springs being retained in their places within the hollow slit of the catch-frame by means of their elasticity. The catches project a little beyond the outside edge of the catch-frame, and are in this projecting portion furnished with a slit in which works an oval or elliptical wheel, hereinafter termed the lever wheel, which lever wheel may be made of brass, iron, or other suitable metal, and attached by a pivot or axle to the outside edge of the catch-frame, in such a manner as to be able to turn freely in either direction. Near one end of the transverse axis of the lever wheel is attached a chain, which, on being pulled, causes the lever wheel to partially revolve, and in so doing press back the above-named clips or catches, and so release the inner tube and permit the gaselier to descend, when it may be necessary to lower it. The said chain, which must be of the same length as the gaselier, should be made to pass through a small pipe, so as not to come in contact with the water, which is usual in sliding gasceliers.

2264.—Robert Holt, of Little Lever, near Bolton, in the co. of Lancaster, terra-cotta manufacturer, for "*Improvements in the manufacture and construction of hoods for ventilators.*" Patent dated Sept. 16, 1864.

This invention consists in manufacturing the revolving hoods of ventilators of terra-cotta or other earthenware, instead of sheet metal, as heretofore customary. The improvement consists in making a small opening through the back of the hood opposite the main orifice for assisting the draught. The chimney top is also made of terra-cotta or other earthenware, as in chimney tops without hoods of the present construction; the pivot for the hood is also made as usual. By thus manufacturing revolving hoods, they are rendered much more durable and less expensive.

2273.—Charles Stevens, of the firm of Stevens and Henderson, of 31, Charing Cross, in the co. of Middlesex, for "*An improved machine for forcing up water.*" A communication. Provisional Protection only obtained. Dated Sept. 17, 1864.

This improved machine, which may be termed a pivot pump, is of simple construction, although possessed of considerable power. It consists in the employment of two metal drums, the outer one of which is stationary and of larger diameter than the inner one, the latter being made to revolve by means of a vertical shaft, to which any motive power can be applied. To the inner drum are bolted two half circular arms, furnished with teeth gearing one with the other; these arms revolve with the inner drum, and act as pistons, driving the water between the inner and outer drum before them. The water enters by top and bottom gratings made for that purpose in the outer drum. The circular arms have each a support forming part of them, by which they are bolted to the inner drum; a separation piece is so fixed in the large drum that during half a revolution of the inner drum one circular arm maintains the other in a fixed position, during which the latter drives before it the water through pipes arranged for carrying it off, and then makes a half circular movement and secures the other arm, which works in the same way. This circular movement of the arms is caused by a curved slide-piece arranged for that purpose. As fast as the water is forced up by the piston arms, fresh water passes into the body of the drum, through the gratings.

2277.—Richard Chrimes, of the firm of Guest and Chrimes, of Rotherham, in the co. of York, brass-founders, for "*Improvements in hydrants or fire-cocks.*" Provisional protection only obtained. Dated Sept. 17, 1864.

This invention consists in the employment of a small valve in combination with a sluice valve, in such a manner that when the sluice valve is open, and the hydrant or fire-cock in use, the small valve will be shut, and *vice versâ*. When the sluice valve is closed, the hydrant or fire-cock being out of use, the small valve is opened by a projection on the valve of the sluice pressing upon a valve which is connected with the small valve, thus opening such small valve, and allowing the water to flow out of or escape from the elbow pipe, so as to empty the same and prevent it from being frozen.

2279.—David Hunter Brandon, engineer, of 13, Rue Gaillon, Paris, for "*Improvements in the treatment of tar oils for the purpose of employing the same as paint.*" A communication. Provisional protection only obtained. Dated Sept. 17, 1864.

In manufacturing paint fit for house work, carriages, cloths, and other objects, two different processes are adopted, according to this invention, in both of which tar oil constitutes the principal ingredient.

The first process consists in the manufacture of paint formed of tar or mineral oil, vegetable oil, and drying ingredients, in the following proportion:—Tar oil, from 55 to 80 per cent.; vegetable oil—such as linseed oil, poppy oil, nut oil, and other similar products—20 to 45 per cent.; drying ingredients—such as subcarbonate of iron, oxide of lead, sulphate of lead, sulphate of zinc, manganese, and other similar chemical ingredients—equal to about one-tenth in weight of the vegetable oil, which two latter ingredients are boiled together until they are of a proper consistency; the tar oil is added subsequently, and the whole agitated to ensure proper mixture and allowed to cool; the requisite colouring materials being added. It can be employed in the same manner as the usual paints.

The second process consists in manufacturing paint with tar oil, vegetable oil, and Norway tar, in the following proportions by weight:—Tar oil about 16 parts, vegetable oil about 10 parts, and Norway tar about 4 parts; for this purpose the vegetable oil is boiled down to the requisite consistency, after which the two other ingredients are added to it, either before or after cooling, and the whole agitated; the desired colouring material being added, it is then fit for use.

2282.—John Hamilton Burns, of Glasgow, in the co. of Lanark, N.B., gentleman, for "*Improvements in the distillation of volatile minerals, vegetable and other organic matters.*" Provisional protection only obtained. Dated Sept. 17, 1864.

This invention consists essentially in passing through the distilling vessel containing substances to be distilled, a current of boiling oil or other liquid, the boiling-point of which is higher than that of water.

2315.—Edward Thomas Hughes, of the firm of Hughes and Son, 123, Chancery Lane, London, for "*An improved fan to be employed for ventilating and other purposes.*" A communication. Patent dated Sept. 21, 1864.

The case of the fan or ventilator is composed of two parts bolted together in horizontal lines centrally with the shaft, representing the diameter of the fan, and one of the side holes for the admission of air. The shaft revolves in pedestals or bearings fixed to the frames, which are cast with the lower part of the case. The wings are of a curved form, and two in number, but a greater number may be used when required. The wings start from bosses on the shaft, in order that the air which passes through the air-holes shall gradually increase its speed as it is gliding towards the extremities of the wings, and thereby considerably augment the suction and blowing power of the fans, and at the same time materially lessen the noise common to ordinary fans. To lessen still further the sound caused by the air entering the case, a partition may be fixed in the middle of each wing, so that the two currents of air entering the sides of the case may not come in collision with each other.

2364.—Henry Bennison, of Burrage Road, Plumstead, in the co. of Kent, and of Hobart Town, Tasmania, gentleman, for "*Improvements in fluid-meters.*" A communication. Patent dated Sept. 27, 1864.

This invention relates to rotary apparatus for measuring water and other fluids. The apparatus has a rotary wheel or centre-piece mounted on a suitable axis. One-third, more or less, of this wheel is enclosed by a case covering the periphery and both sides. Between the extreme diameter of the case and the circumference of the wheel or centre-piece, there exists a segment of an annular space, whose area is available as the measuring compartment for the fluid. The centre or wheel has two, three, four, or more pistons or pellets at equal distances apart, which are projected in succession from and drawn within the periphery of the wheel. They are projected just after passing an abutment, which forms the limit of the measuring space in one direction, and which is in contact with the periphery of the wheel. These pellets are disposed radially in suitable slots in the periphery of the wheel, and are supported by stems actuated by projections on each side operated on by a cam or cams fixed to the stationary plates enclosing the sides of the wheel or otherwise, which cams regulate the pellets in such manner that they are withdrawn within the periphery when required to pass the abutment, and again projected at the proper time. Or they may be actuated by springs which allow the pellets to recede on passing over an incline leading to the abutment, and which project them as soon as that point is passed. The springs must be sufficiently strong to overcome the pressure of the water on the edge of the pellets.

When a pellet or piston passes the stationary abutment, and is projected into the segmental chamber, the pressure of the water to be measured (which must of course flow from a higher level) takes effect upon it, and so moves the centre or wheel round. Before this pellet escapes from the chamber (having completed, say, a quarter of a revolution, and supposing there are four pellets) the succeeding pellet will have entered and received the pressure of the water. So soon as this is the case, the first pellet emerges from the chamber, and allows the water or other fluid which has acted upon it to escape, and so on.

The centre of the sides and periphery of the wheel or centre may be enclosed, and a suitable channel provided to conduct the fluid away from the apparatus at a point after it has passed the limits of the capacity determined as the measuring-chamber, which will depend on the number of pellets in the circumference, and will be the capacity of the case between any two pellets. Supposing there be four pellets, the space will be four times filled at each revolution.

A registering apparatus is applied to indicate and register the number of revolutions, and the capacity being known, will show the quantity of fluid passed. The apparatus is applied for measuring water and other fluids, and is somewhat similar to motive-power engines, for which letters patent were granted to the present inventor on the 3rd of March and 1st of September, 1864, Nos. 535 and 2149.

As a meter for measuring water it is preferred that the space through which the pellets move should be enclosed throughout the circumference of the case. It is preferred also to employ two pellets, which determines the measuring capacity as extending to one-half the circumference, the other half of the circumference being occupied by the inlet and outlet, and by the cam and abutment surface.

2384.—John Weems, and William Weems, of Johnstone, in the co. of Renfrew, N.B., engineers, for "*Improvements in engine-governors and in apparatus for indicating and regulating the flow of fluids and liquids.*" Patent dated Sept. 28, 1864.

This invention relates, firstly, to improvements in apparatus for governing and controlling the working speed of both land and marine engines, air, water, and gas engines, as well as water-wheels, and other such generally similar mechanism.

The invention relates, secondly, to improvements in apparatus for regulating, measuring, and registering the flow of liquids and fluids. These latter improvements are based upon an invention of "Improvements for indicating the pressure or quantity, and in regulating the discharge of fluids," for which the present patentee obtained letters patent, dated March 17, 1862, No. 734.

One modification of the first part of the invention is applied to the governing and controlling the speed of engines, water-wheels, turbines, and other similar mechanism, and consists of a plain or corrugated diaphragm, or diaphragms; or tubes of india-rubber, leather, or other flexible material, fitted within a chamber, may be used. Resting on or attached to that side, which is exposed to the pressure of the steam, or other fluid or liquid, is a spindle or rod, in connexion with an equilibrium, throttle, conical, or other valve or valves, the valve or valves being situated between the boiler and the engine, or, in the case of a water-wheel or turbine, between the water-head and the wheel of the turbine. The opposite side of the diaphragm is in connexion with a single or double-acting, or other suitable pump or pumps, or with any convenient apparatus for forcing fluids or liquids. A crane or cock, fitted with an indicator whose area of aperture is capable of being regulated and opened to the atmosphere, or to any convenient receptacle, is placed between the side of the diaphragm last referred to, and the pump or other contrivance for forcing fluids and liquids. When the pump is set in motion, the fluid or liquid is forced against one side of the diaphragm, or other flexible partition, whilst the pressure of the steam or other fluid is exerting its energy upon the opposite side; and when the machine to which the governor is applied has obtained the requisite amount of motion, the crane, cock, or other opening and closing apparatus is adjusted, to allow the excess of the fluid to escape. When on the slightest increase of speed the power of the pump, or other fluid or liquid forcing apparatus, is also increased, a greater quantity of the fluid or liquid is forced against the diaphragm, the additional quantity cannot escape through the opening of the crane or cock, and thus greater pressure is exerted against the diaphragm, and a forward motion imparted to it, which motion regulates the area of the admission-valve opening, and thus the supply of the moving fluid or liquid is regulated. When the area of the valve opening is thus reduced, the speed of the engine is reduced in proportion to the diminished supply of the moving liquid or fluid.

The second part of the invention consists of a chamber, within which is fitted an equilibrium, common throttle, or other valve, the spindle or rod of which is attached by a lever and rod or otherwise to one end of a plain or corrugated diaphragm, or diaphragms, or tube of india-rubber, metal, or other flexible material, open on one side to the pressure, and having a lever with an adjustable weight on the other side. When the steam or other fluid exceeds the desired pressure, it exerts a power on the diaphragm, which regulates the valve so as only to admit a sufficiency of steam to maintain the desired pressure. On the top or bottom of the valve-case is fixed a stuffing-box, through which passes a screwed spindle, at one extremity of which is fixed the wheel, which when screwed forward closes the valve and checks the passage of the fluid or liquid.

2393.—Coleman Defries, of the firm of Jonas Defries and Sons, of Houndsditch, in the City of London, manufacturer, for "*Improvements in lighting and ventilating.*" Provisional protection only obtained. Dated Sept. 29, 1864.

These improvements refer principally to the lighting by gas of public buildings, theatres, music-halls, or other large places where much light is required, and also where provision should at the same time be made for the ventilation of the area between the floor and the ceiling. In lighting a music-hall with a level or plain ceiling and ordinary roof, the ceiling is divided in the first instance into squares by means of joists, open spaces being left varying in width according to the area of the ceiling between each joist. These joists crossing at right angles, offer large and small squares and oblong openings. Between the ceiling and the roof is arranged the lighting apparatus which is composed of a series of sun lights or other gas-burners placed under covers or shades, which are constructed in the shape of an inverted funnel. The inner part of these metal shades is galvanized, or otherwise treated to assist in throwing down the light and forming a reflector. The pipes of these shades are led into other converging pipes, and finally into a horizontal cylinder or cylinders, which traverse under the entire roof and have exit into the open air. These cylinders are furnished with cowls or other contrivances for securing the exit of the products of combustion and the exclusion of the atmospheric air.

The larger spaces in the ceiling are filled with squares of glass, the oblong apertures with moveable prisms of glass placed crossways in relation to the length of the aperture, and the square openings formed by the meeting and crossing of the joists with cut-glass lustres made in open work, so as to allow the air to pass freely through them. By this arrangement, although the whole ceiling appears from below to be a solid or unbroken plane, all but the parts filled by the larger squares of glass is open—*i. e.*, the prisms placed crossways in the openings between the joists are not placed close together, and thus allow, as do also the lustres, the air to pass freely through them. Thus, too, when the gas is lighted, a strong light is thrown downwards through the glass ceiling, and the prisms and lustres appear like billiant ornaments at the same time that they allow of the escape of the foul and heated air which arises from the audience, or area between the floor and the ceiling, into the area between the ceiling and the roof, where it is caught up and passed through the escape cylinders before mentioned into the open air.

The invention is equally applicable to ceilings in apartments or stages, and the openings for ventilation by means of prisms and lustres may be of any form or size; and if prisms and lustres be in some cases considered as too expensive, the openings may be filled with perforated glass and slips of glass, or any transparent material, so that provision is made for ventilation.

2407.—Alexander Angus Croll, of Coleman Street, in the City of London, C.E., for "*Improvements in the treatment of sulphate of alumina.*" Patent dated Sept. 30, 1864.

These improvements relate to combining caustic lime or carbonate of lime with sulphate of alumina, for the purpose of neutralizing free acid resulting from its manufacture.

For this purpose the caustic lime or carbonate of lime is added to the sulphate of alumina whilst the latter is in a heated state, or before it has been allowed to cool down to about 200° Fahr., or much below that temperature; and the carbonate of lime is employed in a state of fine powder, such as ground whiting, and in the proportion of about three parts thereof to the quantity of sulphate of alumina to be operated upon, and which has arrived at a sufficiently concentrated state to be enabled to form cake on becoming stiff or solid when cool. These proportions will, however, be dependent upon the condition of neutrality desired to be obtained, or the amount of uncombined acid required to be neutralized.

2430.—Walter Smith Cowles, of the city of New York, U.S.A., for "*An improvement in means for adapting casks and analogous structures to retain petroleum, naphtha, and the like fluids.*" A communication. Patent dated Oct. 3, 1864.

This invention consists in partially or entirely saturating the material of the cask at and near its inner surface with one substance, and at and near its outer surface with another and different substance, employing a material on the inner surface which will resist the action of the petroleum or other fluid to be contained in the cask, and employing a material on the outer side which will resist the action, and prevent any escape of the said lining material. By the aid of both, the important end is attained of retaining the contents of the casks, and allowing their storeage for any length of time, and also their exposure to ordinary changes of temperature, or of hygrometric condition of air, and their transportation to any distance without loss or danger. Oily material is employed for the outer side, and alkaline material for the inner side, of the staves and heads.

2432.—Richard Laming, of Priory Road, Kilburn, West Hampstead, in the co. of Middlesex, for "*Improvements in making ammoniacal preparations.*"—Patent dated Oct. 4, 1864.

In a patent bearing date Nov. 26, 1863, the present inventor described as a new invention the desulphuration of the ammoniacal liquors of gas-works by forcing into them while containing oxide of iron a current of atmospheric air. He states that he has since found the same effect to be produced with more or less rapidity without forcing in the current of air. For this purpose he exposes to the atmosphere the ammoniacal liquor of gas-works with five or ten or other small per centage of sulphide or oxide of iron, which he prefers should be hydrated peroxide made by precipitation, stirring the mixture occasionally, or incessantly, to keep the metallic substance in suspension until the desulphuration is complete, when he allows it to settle, and then draws off the liquor more or less clear, or filters it for use. The vessels employed should be of large area, and not very deep, in order to favour the contact of the atmosphere with the sulphide of iron formed during the process, and which is necessary for the peroxidation of the metal.

Ammoniacal liquors of gas-works, desulphurated by oxide of iron, or other means, still retain a disagreeable odour, which is usually got rid of by subjecting them to evaporation after saturation, by some acid capable of fixing their ammonia at the evaporating temperature. One part of this invention consists in depriving such liquors of disagreeable odour by a sufficiently long and extensive contact with charcoal. Such a contact may be established in various ways, but preference is given to the following:—A dozen, or more or less number, of vats are filled with charcoal in small fragments, obtained by preference from the carbonization of tan, sawdust, or other waste or cheap organic material, enclosing it in each vat between a false bottom and a false head, both pierced with numerous small holes. The vats are connected together with pipes, in such a manner that the liquor being made to run through the sieves ascends in each vat in succession, the speed of its passage being made slower as the vats are smaller, or fewer in number, and always so regulated that no liquor leaves the series until sufficiently deodorized for the purpose for which it is wanted.

When the deodorization has become inconveniently slow, the first vat is put out of connexion, recharged with a packing of fresh charcoal, and then made the last in the series, and so on continually, in order that the liquor may always enter by the foulest vat and leave by the purest. It is found advantageous to practise this deodorization at low temperatures. It is preferred to have the charcoal packed from the air for storeage while it is yet hot, and never afterwards exposed more than is necessary.

This deodorization by charcoal may be practised with full effect upon the ammoniacal liquors of gas-works without submitting them first to a process of desulphuration, but in that case the charcoal absorbs sulphuretted hydrogen, as well as other odorous substances, and becomes in consequence more quickly expended. It is preferred to deodorize the liquor after its desulphuration, and sometimes there is first passed into it carbonic acid, liberated from some ammoniacal source—as, for example, a separate portion of similar liquor under the action of sulphuric acid, until the ammonia is thereby raised in the liquor to be deodorized to the state of sesqui-carbonate or bicarbonate.

The manner of obtaining ammonia in the state of gas, or dissolved in water, by the action of lime or some equivalent caustic earth, or caustic alkali, upon an ammoniacal salt, usually sulphate or muriate, and distillation is well understood.

Another part of this invention consists in obtaining ammonia in the state of gas or dissolved in water, by performing the usual process with the ammoniacal liquors of gas-works deodorized by charcoal, and whether desulphurated by a separate operation or not, as a substitute for the solution of ammoniacal fixed salt by which a product is obtained more or less pure according to the purposes for which it may be required. The acid which has to be detached from the ammonia is chiefly carbonic, which combines with the lime or other equivalent substance used in its place, and becomes precipitated or not from the liquor, according as the carbonate formed may be either insoluble in it or soluble. When an insoluble carbonate is formed, the liquors become at once a solution of free ammonia, more or less pure, and the purer if they have been sub-

mitted to a previous distillation. For obtaining pure ammonia, either in the state of gas or dissolved in water, it is preferred to distil the liquors subsequently to their treatment with lime or its equivalent, and also, as a precautionary measure for keeping back the last portions of carbonic acid, to wash the ammonia as it passes from the distilling vessels in a bath, hot or cold, of milk of lime or caustic alkali, or both. Care should be taken to prevent any of the charcoal which has been used for the deodorization from entering the distillatory vessels with the deodorized liquor, as the odour absorbed by the charcoal is not all retained by it at the distilling temperature. The fine charcoal which passes in small quantities with the liquor may be easily separated by using a suitable filter at the outlet of the deodorizing vats.

Another part of this invention consists in the application of the ammoniacal liquors of gas-works, deodorized by charcoal, with or without the separate desulphuration, to the manufacture of a compound of ammonia and carbonic acid, more or less pure, and either in the solid or liquid form. This application is sometimes made by conducting carbonic acid gas from any suitable foreign source into water or a condensing-chamber containing or receiving ammonia obtained in the manner described. In the case of the water it is a solution of either protocarbonate, sesqui-carbonate, or bicarbonate of ammonia, which is thus produced according to the proportion of carbonic acid introduced in the chamber. By thus introducing an adequate quantity of carbonic acid, there is obtained in a concrete form, chiefly sesqui-carbonate of ammonia. Sometimes the application is made by suppressing the lime used in the foregoing part of this invention, and driving over, by some suitable process of distillation, such, for instance, as that modification of Coffey's continuous process for alcohol which has been publicly made known to be useful in many works, both the ammonia and the carbonic acid of the deodorized liquors, combined with enough steam to keep them in the condition of vapour, into cold water, or into a suitable condensing-chamber, there to meet, if need be, with such further quantity of carbonic acid from some foreign source as they may be capable of combining with. Solutions of carbonate, sesqui-carbonate, and bicarbonate of ammonia, made in either of these ways, may be used for purposes to which such solutions are respectively applicable, or such as are rich enough in carbonic acid may be, by the usual means, made to render up to a condensing-chamber sesqui-carbonate of ammonia in a concrete form. That salt, however, obtained by that invention may afterwards be submitted to the ordinary process of sublimation for giving it the form in which it is known in commerce under the name of carbonate of ammonia.

To secure great purity, care must be bestowed in working the invention to obtain as pure as possible both its elements; and for that purpose, whenever any part of the carbonic acid, as well as the ammonia, is furnished by the deodorized liquors, it is recommended, as a precautionary measure, that the vapours of the compound be driven through a bath of fixed inodorous oil, or of water containing some carbonated alkali, or both, heat enough being everywhere maintained to prevent the choking of the apparatus leading to the condensing-chamber.

The patentee does not restrict the application of his deodorizing invention to the ammoniacal liquors of gas-works while holding their ammonia in a volatile condition, as the charcoal acts upon them after their ammonia has been converted into sulphate or muriate by the process known to be effectual for that purpose. The ammoniacal liquors thus deodorized, after conversion, are useful as economical substitutes in many cases for water in which crystals of the same salts have been dissolved, such, for example, as the manufacture of liquor of ammonia, by the decomposing agency of lime, or distillation.

The claims are—

1. Desulphurating the ammoniacal liquors of gas-works when containing small quantities of sulphide or oxide of iron by facilitating the access of the atmospheric air by stirring.

2. Deodorizing the ammoniacal liquors of gas-works—whether previously converted into a solution chiefly of sulphate of ammonia or of muriate of ammonia or not, and whether previously desulphurated by a separate operation or not—by bringing them into sufficiently long and extensive contact at effective temperatures with charcoal obtained from any desirable source.

3. Obtaining solutions of free ammonia or ammonia gas, more or less pure, in or by distillation from the ammoniacal liquors of gas-works deodorized by charcoal, whether those liquors have been previously desulphurated by a separate operation or not.

4. Obtaining by distillation compounds of ammonia and carbonic acid, more or less pure, and either solid or in solution, from the ammoniacal liquors of gas-works, deodorized by charcoal, whether they have been previously desulphurated by a separate operation or not, and whether the carbonic acid be wholly or in part or not at all derived from other sources.

5. The use of heated baths of fixed oil, and of the carbonates of soda and potash, for purifying passing vapours or any carbonate of ammonia.

2453.—Thomas Brown, of 4, Dagmar Road, South Hackney, in the co. of Middlesex, engineer, for "*An improved cap designed for increasing the upward draft of chimneys and for ventilating ships and buildings.*" Patent dated Oct. 6, 1864.

This invention consists of an improved ventilating cap, consisting of an inner and outer cap, the inner cap being closed at the top, and having apertures at the sides protected by an external cap open at the top and bottom, the sides of the two caps being inclined, and adapted to each other and to the current of external air, so as to ensure the deflection or reflection of the outer and the free passage of the inner current from the building, chimney, or place to be ventilated.

2472.—George Haseltine, of 12, Southampton Buildings, Chancery Lane, in the co. of Middlesex, C.E., for "*An improved process for purifying coal and ores.*" A communication. Patent dated Oct. 7, 1864.

The object of this invention is to neutralize and destroy the sulphur and other impurities that are found in coal and ores, and it consists of mixing certain chemicals with the minerals that are to be treated, and then subjecting them to the action of steam. By this means impure coal may be freed from sulphur, and rendered available for purposes such as forging, smelting, the manufacture of gas, and the like, for which it may have been wholly unsuitable. Ores of iron containing sulphur, and that therefore produce "red-short" iron, may be purified to improve the quality and quantity of the yield, and ores of gold may be more easily and perfectly amalgamated than by the present ordinary process, in which the action of the mercury is to a very great extent prejudiced by the presence of sulphur, notwithstanding the action of any moderate amount of fire that may be brought to bear upon it.

The coal or other mineral that is intended to be treated is placed in a retort or tank, and mixed with acid and alkaline agents, either in solution or in a dry state. The tank is then closed and steam admitted for a few hours. After the steam has been shut off and the tank opened and allowed to cool, the water may be drawn off, and the purified mineral applied to the purpose or use for which it was intended.

The proportion of the chemicals which it is preferred to use in treating, for instance, a ton of common soft coal, that is ordinarily impregnated with sulphur, is, one pound of caustic soda, three pounds of carbonate of soda or sal soda, a couple of ounces of nitric acid, and one pound of borax; but this proportion may be varied to suit the exigencies of the case. To avoid waste and to obtain the best results in the most economical manner, it may be advisable, before operating upon a large quantity of ore or mineral that has not been previously treated in this manner, to begin with a few experiments, for the purpose of determining with exactitude the proportions required.

In a similar manner it may be found convenient and advantageous, in some cases, to replace the soda with common lime and salt, and the nitric acid and borax with saltpetre; and under circumstances where all the materials cannot be obtained, but where even a partial purification is desirable, the use of some of them only—involving, however, at least, the use of one of an acid and one of an alkaline nature—may be adopted in combination with the steam in the manner described, but the materials and proportions above given, or their equivalents, are preferred.

The duration of the action of the steam should be from six to ten hours, in accordance with the temperature and pressure employed, as it is manifest that with the use of a high pressure and superheated steam the operation may be more quickly performed.

The claim is for the process substantially as described, of mixing coal or other minerals with acid and alkaline agents, and subjecting them to the action of steam, in the manner and for the purpose specified.

2484.—James George Beckton, of Whitby, in the co. of York, C.E., for "*Improvements in heating retort and other ovens for the distillation of shale, coal, and other substances.*" Patent dated Oct. 10, 1864.

This invention has for its object the heating of retort and other ovens employed in the distillation of lias and other shale, coal, and other substances, for the manufacture of petroleum, or other oils or gases, in a more economical manner than heretofore. It consists in so combining or connecting such retort or other ovens with the blast-furnace employed in the manufacture of iron, or with other furnaces of like character, as that the waste gases therefrom may pass into and be utilized and employed for heating such retort or other ovens.

For the purposes referred to, the series of ovens are arranged at suitable intervals apart above a flue or tunnel, whereby the gas or gases required to be utilized is or are conveyed from the blast or other furnaces. Each oven may contain ten or any other convenient number of retorts suspended from or attached by their upper ends, leaving their lower ends unconfined, except in so far as regards lateral movement, to suitable girders, carried by the walls of the oven, and formed as troughs or pipes through or along which a circulation of water may be kept up for the purpose of preventing injury to the girders by the heat of the ovens. The oven or chamber in which the retorts are suspended as described, is by preference made oblong in form, and the retorts are suspended in two or more rows running parallel with the direction of the flue or tunnel, so as to leave space between the rows to act as a chamber for the combustion of the gas or gases.

The manner of introducing the gas or gases from the flue or tunnel into the chamber and effecting their combustion is as follows:—In the upper part of the flue or tunnel, beneath the opposite ends of the chamber, are two or more vessels, provided with slides or valves for regulating the admission of gas to the chamber, and terminating above two or more grates, upon which fuel is burnt for the purpose of igniting the gas or gases, and which are arched over so as to partially confine and guide the ignited gases into the chamber, where they divide and pass between the retorts. The products of combustion are carried off by flues or tunnels situated at each side of the flue or tunnel whereby the gas is supplied to the several ovens. The upper ends of the retorts are provided with removable covers, for the purpose of allowing the lias, shale, or other material, to be supplied to them, and are connected together by lines of rails running from end to end of the entire series of ovens, so as to enable waggons or carriages containing the material to be brought over and discharged into any required retort, the waggons being raised from the ground to the level of the rails by means of a steam or other platform lift; and after being emptied, being lowered by means of a balance lift at the contrary end of the railway.

The products of combustion pass from the retorts by means of pipes, which hang down within them, and are suitably perforated to permit the entrance of the products; and thence into a main or pipe, whereby they are carried off. The matters remaining in the retorts after the distillation has been completed are discharged from their lower ends, which are fitted with removable covers for the purpose, into waggons running upon suitable lines of railway beneath them.

2487.—John Cassell, of La Belle Sauvage Yard, in the City of London, publisher, for "*Improvements in treating coal, peat, shale, wood, and ligneous products, and in obtaining fuel, oil, and other products therefrom.*" Patent dated Oct. 10, 1864.

This invention consists in placing the raw products into retorts or ovens heated from the outside, or otherwise, in any ordinary manner, according to the nature of the material acted upon, and causing to pass through the material currents of vapour highly charged with electricity generated in what is known as Beauregard's apparatus, or by any other means. Or such vapour is brought in contact with the products resulting from

distillation of the materials in the retorts. They are then condensed by ordinary means, and oils and other volatile products obtained, while the residuum in the retorts is gathered in the shape of charcoal, coke, and heavy hydrocarbons.

2495.—Thomas Lambert, of Short Street, New Cut, Lambeth, in the co. of Surrey, engineer, and Henry Charles Soper, of Cleaver Street, Lambeth, in the same co., in the employ of the said Thomas Lambert, for "*Improvements in the manufacture of taps, cocks, or valves.*" Patent dated Oct. 10, 1864.

In carrying out this invention the patentees construct the body or shell of the tap or cock of cast iron, as has before, in some cases, been done, and this may conveniently be galvanized exteriorly. With such a body or shell they combine a cone or plug cast in a metal mould, and, consequently, in the material known as Baron Vaucher's metal, which is, an alloy of zinc, tin, lead, and antimony, and for which letters patent were granted the 3rd of December, 1849, No. 12,876. The plug goes into its place without being previously turned, which has always heretofore been necessary, as it is when it leaves the mould quite true in form and size, and a little grinding to smooth the iron shell is all that is required to make the tap or cock quite tight. In this manner, in manufacturing taps or cocks, the labour of turning and finishing the cones or plugs is divided, and a very durable article is produced. In casting the cones or plugs they employ a metal mould made to receive at its ends the iron cross head for the top of the cone or plug, and a screw for its lower end, this screw being to receive the nut which is to secure the cone or plug in its place in the body or shell. The mould also receives a metal core to form the water-way of the tap or cock, and being thus arranged the metal is poured into it, and when it is taken out the cross head and screw are found firmly fixed in the cast metal; when the core has been forced out of the water-way, and the gate or runner cut off, the plug is ready for use.

2497.—John Ives Vaughan, of Appleton, in Widness, in the co. of Lancaster, chemist, for "*Improvements in the manufacture of resins and resinous substances, and in the apparatus employed therein, parts of such improvements being also applicable to the refining of coal, petroleum, and bone oils, and also paraffin, and analogous acids and hydrocarbons.*" Patent dated Oct. 11, 1864.

The first part of this invention relates to an improvement in the manufacture of, or the mode of obtaining, products from resinous substances, and consists in carrying on continuously the process of separating the spirit from the heavier substances contained in the crude turpentine, or similar balsams, and refining the residual resin by distillation, without cooling or packing in the interval between the operations.

The second part of the invention consists in the arrangement or construction and working of the apparatus for the purpose of the distillation, affording thereby a means of supplying the crude substance in a continuous flow of the volatilized or distilled product, and the residuum therefrom, which may be intermittent at the will of the operator, and in accordance with the requirements of the article under treatment.

2510.—Frederick Wilkins, of 254a, Oxford Street, and 287, Regent Street, both in the co. of Middlesex, gas engineer, for "*Improvements in apparatus for the production of hydrocarbon vapour, and for the application of the same to illuminating or heating purposes.*" Patent dated Oct. 11, 1864.

This invention relates to improvements in apparatus for the production of hydrocarbon vapour, such as that from petroleum or paraffin, benzole, benzine, or naphtha, and for the application of the same to illuminating or heating purposes. The principal objects of the invention consist in saturating atmospheric air with hydrocarbon vapour for lighting and heating purposes; also, for enriching common coal gas so as to increase its illuminating power. The apparatus employed in carrying out the invention cannot be intelligibly described without the aid of drawings. The patentee claims the general arrangement and combination of parts of the apparatus or receptacles for the volatile liquid; the combination of an endless chain or band and sheaf, in connexion with a weight furnished with pawls, the effect of which arrangement is to maintain the constant action of the apparatus and to render it capable of renewal without ever extinguishing the lights. He claims also the use of cups or floats as described, the application of circular or other brushes, the use of two or more such apparatus, or one double drum arrangement working together, the effect of which is to correct any irregularity which may exist in any single apparatus; and also the use of brushes moving in a separate vessel to be supplied with air or gas by any other means, all substantially as set forth.

APPLICATIONS FOR LETTERS PATENT.

1809.—Isham Baggs, of 54, Chancery Lane, London, electrical engineer, for "*Improvements in the production of artificial light and in the apparatus connected therewith.*" July 8, 1865.

1816.—Hector Auguste Dufrené, of 10, Rue de la Fidélité, Paris, civil engineer, for "*An improved self-acting apparatus for obtaining a circulation of volatile liquids.*" A communication. July 8, 1865.

1818.—George Thomas Livesey, of the South Metropolitan Gas-Works, Old Kent Road, London, for "*Improvements in treating ammoniacal liquors for purifying gas and other purposes.*"—July 10, 1865.

1833.—Hector Auguste Dufrené, of 10, Rue de la Fidélité, Paris, civil engineer, for "*An improved process for obtaining oxygen.*" A communication. July 11, 1865.

1834.—Nathaniel Jenkins, of Boston, Suffolk, Massachusetts, U. S. A., for "*Improvements in steam and water valves.*" July 11, 1865.

1861.—William Robert Lake, of 8, Southampton Buildings, Chancery Lane, London, for "*Improvements in flexible gas-tubing.*" A communication. July 15, 1865.

1864.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvement in pumps.*" A communication. July 17, 1865.

1866.—John Paul Baugh le Patourel, of 11, Garden Reach, Calcutta, for "*Improvements in ventilators.*" July 18, 1865.

1875.—Thomas Metcalf, Henry Metcalf, and Thomas Clayton, all of Manchester, for "*An improved apparatus for cooling liquids and cooling or condensing vapours or gases.*" July 19, 1865.

1879.—Charles Nicholas, of Cheltenham, plumber, for "*A new or improved apparatus for supplying disinfecting liquids to water-closets, urinals, and other places requiring the same.*" July 19, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1655.—Edward Griffith Brewer, of 89, Chancery Lane, London, for "*Improvements in the construction of taps or valves.*" A communication. June 20, 1865.

1674.—Edward Kenworthy Dutton, of Sale, in the co. of Chester, merchant, for "*Certain improvements in apparatus for measuring and indicating the flow of liquids.*" June 22, 1865.

1677.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*Improvements in surface condensers.*" A communication. June 22, 1865.

1687.—Henry Saxon Snell, of 36, Chancery Lane, London, and Frederick Edward Thomas, of 10, Manchester Terrace, Liverpool Road, Islington, for "*Improvements in apparatus used in supplying gas to burners.*" June 23, 1865.

1695.—Joseph Solomon, of Red Lion Square, London, optician, for "*Improvements in the preparation of magnesium for illuminating purposes.*" A communication. June 24, 1865.

1696.—Charles Ross Bamber, of Jersey, commander, Royal Navy, for "*A new or improved apparatus for producing the magnesium light.*" June 24, 1865.

1703.—Charles Worssam, engineer, of Commercial Wharf, Kingsland Road, and George Evans, gentleman, of Gloucester Place, Portman Square, London, for "*An improved pulping and compressing machine for the treatment of peat as a fuel and gas for illuminating purposes.*" June 26, 1865.

1737.—William Schofield, of Heywood, Lancaster, manager of the Heywood Gas-Works, for "*Improvements in the manufacture of gas-retorts and other articles made of fire-clay, and in furnaces for burning the same, and for other purposes.*" June 30, 1865.

1749.—James Atkins, of the firm of Robert Walter Winfield and Co., of Birmingham, merchants and manufacturers, for "*Improvements in the manufacture of certain kinds of metallic tubes and rods, and in ornamenting metallic tubes and rods.*" July 1, 1865.

1809.—Isham Baggs, of 54, Chancery Lane, London, electrical engineer, for "*Improvements in the production of artificial light, and in the apparatus connected therewith.*" July 18, 1865.

1833.—Hector Auguste Dufrené, of 10, Rue de la Fidélité, Paris, and 4, South Street, Finsbury, London, civil engineer, for "*An improved process for obtaining ozygen.*" A communication. July 11, 1865.

NOTICES TO PROCEED.

571.—James Young, of Manchester, gentleman, for "*Improvements in distilling bituminous substances, and in apparatus employed therein.*" March 1, 1865.

636.—Loftus Perkins, of Francis Street, Gray's Inn Road, London, for "*Improvements in apparatus for heating and cooling atmospheric air and other aëriform bodies, and for heating ovens, and for heating and ventilating buildings.*" March 7, 1865.

704.—William Clark, of 53, Chancery Lane, London, engineer, for "*Improvements in apparatus for holding and regulating the position of lamp-shades or reflectors.*" A communication. March 13, 1865.

648.—John Shanks, of Barrhead, in the co. of Renfrew, N.B. plumber, for "*Improvements in water-closet apparatus.*" March 8, 1865.

669.—Victor Delperdange, of Brussels, Belgium, engineer, for "*An improved method of connecting together tubes or pipes used for conveying gas and water, and for other purposes.*" March 9, 1865.

813.—Thomas Harvey Saunders, of 2, Little Suffolk Street, Southwark, London, for "*Improved means of ventilation by the use of perforated tubular cornices and centre-pieces.*" March 23, 1865.

827.—Matthew Piers Watt Boulton, of Tew Park, Oxfordshire, esquire, for "*Improvements in obtaining motive power from aëriform fluids and from liquids.*" March 23, 1865.

1494.—Hypolite Monier, lighting apparatus manufacturer, of 29, Boulevart St. Martin, Paris, for "*An improved burner for gas and other lighting apparatus.*" June 9, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1934.—James Webster, "*Improved apparatus for the manufacture of gas for illumination.*" July 2, 1862.

1940.—William Mattieu Williams, "*Improvements in apparatus for the distillation of coal and peat, and such other substances as are or may be used for the manufacture of solid and liquid volatile hydrocarbons.*" July 3, 1862.

1955.—Joshua Kidd, "*Improvements in gas-meters.*" July 7, 1862.

1957.—Thomas Edwards, "*Improved movement for the indices for gas, water, and other fluid meters.*" July 7, 1862.

1961.—John Henry Johnson, "*Improvements in wet gas-meters.*" A communication. July 8, 1862.

2025.—Frederick Major Parks, "*Improvements in the manufacture of gas for lighting and heating, and in apparatus employed in the said manufacture.*" July 14, 1862.

Legal Intelligence.

SALFORD SESSIONS.

WEDNESDAY, JULY 5.

(*Before Mr.* MILNE, *Chairman, and Mr.* OVENS.)

THE ASHTON GAS CONSUMERS ASSOCIATION AND THE ASHTON GAS COMPANY.

This case, which was adjourned from the last Salford Sessions, came on again for hearing on Wednesday, the 5th inst. Mr. HIGGIN, instructed by Mr. Brooks, of the firm of Brooks, Marshall, and Brooks, appeared on behalf of the Gas Consumers Association, and Mr. HOPWOOD and Mr. EDWARDS, instructed by Mr. Buckley, for the company. Mr. HALLIDAY, accountant, read the following report:—

(Copy.)

To Her Majesty's Justices of the Peace, assembled in General Quarter Session at Salford, in and for the County Palatine of Lancaster.

Having been appointed by your honourable court to examine and ascertain the actual state and condition of the concerns of the Ashton Gas Company, and to make report thereof, I have made such examination, and have to report as follows:—

1. I find that from the commencement of the Act, in 1847, to the 30th of June, 1864, dividends, at the rate of ten pounds per centum per annum, have been paid to the shareholders.

2. I find that no deduction has been made from the said dividends in respect of income-tax.

3. I find that the income-tax on the said dividends would amount to the sum of £2513.

4. I find that a "reserve-fund account" was opened in the books of the company as at the 30th of June, 1859, and that previous to that date no "reserve-fund account existed in the books. For several years, however, before this date, namely, from 1850, considerable balances remained at the credit of the company's income after payment of dividends, but they were not till 1859 carried to a separate account.

5. I find that on two occasions sums have been taken from the "reserve-fund account" for the purpose of making up the annual dividend to ten pounds per centum, namely, on the 22nd of July, 1863, £203. 18s. 8d., and on the 27th of July, 1864, £91. 12s. 11d.

6. I find that there is now at the credit of the said "reserve-fund account" the sum of £3672. 3s. 6½d.

7. I find that the amount at the credit of the said "reserve-fund account" has not, nor has any part thereof, been invested. The company have expended on their capital account considerably more than they have received on the same account, and they have used or borrowed from the "reserve-fund" to pay for such excess of expenditure.

8. I find that a "contingent and renewal fund account" was opened in the books of the company as at 30th of June, 1859, and that previous to that date no "contingent and renewal fund account" existed in the books.

9. I find that the said "contingent and renewal fund account" was added to year by year, until the 30th of June, 1863, when there stood at the credit of such account the sum of £5700. On the 21st of May, 1864, this account was closed by transferring the said sum of £5700 to the credit of capital expenditure account.

10. I find that by reason of the said transfer of £5700 to the credit of "capital expenditure account," such capital expenditure to the 30th of June, 1864, appears to be very considerably less than it was at the 30th of June, 1863, the expenditure to the first-mentioned period appearing as £44,485. 3s. 4d., and at the last-mentioned period as £50,706. 8s. 5d.

11. I find that no depreciation had been written off the capital expended until the transfer of the said sum of £5700, and that since such transfer a sum of £500 has been so written off.

12. I find that considerable alterations, replacements, and improvements have been made to the works and plant of the company out of the annual income; but whether such alterations, replacements, and improvements rendered it unnecessary to write off any sums for depreciation, it is impossible to say, without going into a valuation of the works and plant. The value of the works and plant stands in the books at the 30th of June, 1864, at £44,485. 3s. 4d., and at commencement of the Act in 1847 at £36,000.

13. I find that the said "reserve-fund account," and the said "contingent and renewal fund account" were created out of the income of the company.

14. Every facility has been afforded to me by the company for the examination of the accounts. (Signed) JAS. HALLIDAY, Public Accountant.

Manchester, June 22, 1865.

Mr. OVENS inquired if the company had got any nest-egg, after what was invested in plant, &c., and besides a certain amount of floating capital?

Mr. HALLIDAY said he was not aware that they had.

Mr. HOPWOOD thought Mr. Halliday had concluded his report very fairly by saying that "every facility had been afforded to him by the company for the examination of the accounts."

Mr. HIGGIN said he was not there to complain of any obstruction. He would shortly explain how the matter originally stood. By the local Act, passed in 1847, the company was established for supplying Ashton with gas, and their capital was fixed at £36,000. It would be one of his contentions before the court, that the company should not increase their capital beyond that sum, except by the creation of new shares—that was to say, if it should be shown that they had a sum laid by of, say, £5000, they could not, by merely transferring it from one set of books to another, increase the capital by that sum of £5000.

The CHAIRMAN said, as he understood it, the question was as to what was to be done with the money over and above that. Was not that it?

Mr. HIGGIN said it was not a question with that court as to management—whether it was well or badly managed. They had nothing to do with the question as to whether the consumers were burthened with bad management or not. There was another section of the local Act which established this—that the amount of the reserve and contingent fund were one and the same fund, and not two separate and distinct funds—that they could not have one fund for the reserve-fund, and another called the contingent-fund. They would find from Mr. Halliday's report, however, that they had had these two funds—the reserve and contingent funds. Looking at their Act, and two or three other Acts of Parliament, he should contend that they could only have one fund, and that, by their special Act, was called their reserve or contingent fund, and might be called either the one or the other. The Gas Works Clauses Act, and the Companies Clauses Act, both of them being amalgamated under the special Act, enacted that the company should deposit with the clerk of the peace certain accounts, containing the total receipts and expenditure, and all accounts and funds received under this, their special Act, for the year preceding, under distinct heads, signed and certified by the chairman of the undertakers. He (Mr. Higgin) would have to show that they had not done this, because the accounts they had furnished from time to time to the clerk of the peace were not such accounts as were mentioned in that Act. He did not intend to do more than draw the attention of the court to this fact, because if they had not done so they were, according to the provisions of the Act, liable to a penalty, which he did not now apply for. The 30th section of the same Act directed that the profits to be divided among the undertakers should not exceed the rate of £10 per cent. on the paid-up capital of the undertaking. Now, supposing that there was an accumulation of capital by transferring a sum of £5000 from one set of books to another, but without the issue of shares, it was part of his contention that that sum of £5000 was not entitled to any dividend at all. Then, by section 31, if the clear profits of the undertaking in any year amounted to a larger sum than was sufficient (after making up the deficiency in the dividends in any previous year) to make the dividend up to the prescribed rate, the excess beyond the sum necessary for such purpose should from time to time be invested in Government or other securities. He took the meaning of that to be that after paying a dividend of 10 per cent., everything that remained over and above that should be invested in certain securities mentioned in the Act, and should go to form a contingent or reserved fund; and therefore, whatever sum they might be able to show, from the examination of the accounts, as from time to time had been in the hands of the company uninvested, the fact of its being uninvested was in contravention of the provisions of the Act, and whatever there might be over and above that which was necessary to pay the dividend, was to go in the reduction of gas to consumers. The section then went on to say that "the dividend and interest arising from such securities shall be also invested in such securities, in order that it may accumulate at compound interest, until the amount reaches £4000, which shall form a reserved fund to answer any deficiency which may at any time happen." So that, assuming they had got a reserve-fund of £4000, and the profits for the year only allowed a dividend of 7 per cent., they were to take 3 per cent. from the £4000, and if that exhausted the fund they were to start again. The 32nd section said that no sum of money should be taken from the said fund for the purpose of meeting any extraordinary claim, unless it be certified by two justices that the sum, as proposed to be taken, was required to meet an extraordinary claim within the meaning of the Act. There could be no doubt of the fact that two sums had been got together under different heads—the contingent and the reserve funds—and they had been dealt with by the company having called in one of these funds on two occasions only to augment their dividend. One of these funds—the contingent-fund—had been dealt with by transferring it in the books of the company. It was not pretended that the company had called it in to meet any extraordinary claim or demand, and if they had it would have been their duty to have gone to the magistrates for a certificate.

Mr. OVENS: The matter is this—the company are not to have a capital beyond £36,000.

Mr. HIGGIN: Except by the creation of new shares.

Mr. OVENS: But Mr. Halliday's report says they have £44,000.

Mr. HIGGIN: In one pocket they have their capital, in the other their profit; and they increase their capital by transferring one to the other. They have no right to do that. I understand they have done it.

Mr. OVENS: They began with a capital of £36,000.

Mr. HOPWOOD: We sold shares to increase that capital.

Mr. HIGGIN: They raised £10,000, which made £46,000, whereas Mr. Halliday had returned it at £44,000, according to their own books. There was another item of £2513 in addition, for income-tax, and the interest on that had not been calculated. They had paid the shareholders their interest without deducting the income-tax. He contended that it was the duty of the treasurer of the company to deduct the income-tax from the dividend, and referred to the 5th and 6th Vic. cap. 35, sec. 40, in support of his remarks. It might be said that railway companies and such others did not deduct the income-tax, but the court must bear in mind that these companies had an unlimited dividend—that was to say, there was no statutory sum beyond which they should not go.

Mr. HOPWOOD said there was, indeed, a special limit, beyond which if they went the Government might buy them up.

Mr. HIGGIN said if they went beyond a certain sum in dividend they were not bound to reduce their fares. There was no Act to compel them to do that, like the Gas Clauses Act, which protected the consumers of gas, who were now absolutely bound to be consumers, whether they wished it or not. He submitted that it was the duty of the treasurer of the company to ascertain what was the tax to be paid on various dividends, and to deduct it from the dividends before payment. If he were right in that construction, then he contended that there was a sum of £2513 which ought to have been paid in the shape of income-tax, and deducted from the dividends, but instead thereof the full dividend had been allowed. This fact being so, it came to this—that the shareholders, during the past 17 years, in the course of which the £2513 had accrued, had been receiving a dividend at a greater rate than 10 per cent., which ought to have been deducted. That sum had not been deducted, but remained on the books of the company as profit, and ought, therefore, to have been mentioned as income by Mr. Halliday—as a sum now in their hands, transferred in some way or other over and above the increase of capital. He understood it was to be one of the contentions on the part of his learned friend on the other side, that the company were entitled, under the Companies Clauses Act, to have two separate funds. He (Mr. Higgin) had already referred to the special Act in which the one fund only was contemplated, but was called indifferently the reserved or contingent fund. He believed the Gas Clauses Act called it the reserved-fund, and the Company's Clauses Act the contingent-fund. The Gas Clauses Act was one passed for the protection of the public, and it said that the company should not have more than 10 per cent. dividend.

Mr. OVENS: Can you give us the figures you rely upon?

Mr. HIGGIN: There is first the reserved fund of £3672, income-tax £2513, and then there is the interest on the income-tax, the amount of which Mr. Halliday can perhaps tell us.

Mr. HALLIDAY: It is upwards of £600.

Mr. HIGGIN: Then there is the contingent-fund, transferred to capital account, £5700. Mr. Halliday can perhaps tell us about a £500 which was taken from revenue for the contingent-fund in 1864.

Mr. HALLIDAY: That £500 went direct to the capital.

Mr. HIGGIN: These sums make altogether £12,985 which have been taken from the revenue, and after deducting £4000 for the reserved fund, there will be £8985 applicable to the reduction of the price of gas.

Mr. OVENS: What order do you want us to make?

Mr. HIGGIN: You have power to order a reduction of gas. I am not prepared to show to what extent the price of gas should be reduced in such a state of things.

In reply to a question, Mr. HALLIDAY said there were considerable sums charged against income each half year, in some more than in others, for the purpose of replacement and extension of the works.

Mr. HOPWOOD: The Act of Parliament authorizes us so to do.

Mr. HIGGIN: Yes, out of the reserve-fund. But that fund must be invested in Government securities, to take money out of it for replacement.

Mr. OVENS: What about the ordinary repair of gas-piping, and small matters of that kind?

Mr. HIGGIN said that over and above those sums which they had been enabled clearly to trace from time to time, sums had been taken from the income of the company for the renewal of plant and so on, and he also believed for extension. If the court should think the figures he had referred to were substantially made out, he should submit whether, upon an adjournment, the gas company could agree with the public. Whether they could do so or not he did not know, but he thought it would be very desirable.

The CHAIRMAN said it would be better if they could.

Mr. HIGGIN said he was bound to say there were some things which the Court of Quarter Sessions could do, and others which they could not do. He did not use this as a threat, nor had he been instructed to do so, but there was only one other power which could effectually assist the public of Ashton, and that was the Court of Chancery.

Mr. HOPWOOD said his friend would perhaps like it to stand over until he went there. He (Mr. Hopwood) would have to go at length into this matter, because there seemed to be lurking in the minds of the public, a feeling that the company had something to keep back—something to hide; but he would make bold to say that Mr. Halliday's account itself showed that this was not so. Mr. Halliday had had every opportunity allowed him, and as he himself said, in answer to the forcible, but not very flattering terms to the company, that they had no nest-egg hidden in this matter. The gas-works were started in 1847, with all the probability of reverses. They were commenced with boldness and enterprise, and the Act of Parliament gave them certain privileges. Those privileges were limited first by the one limit put upon them that they were arguing that day. For years the company had gone on, and what had been its past history? Would the court believe him when he said, in spite of the attack made upon them, that they compared in the highest degree favourable with any other corporate gas town? They were under most of them in the price of gas. In Ashton the gas was 4s. per 1000 to part of the consumers, and going as low as 3s. 2d. to large consumers; in Stalybridge, 4s. 6d.; Oldham, 4s.; Rochdale, 4s.; Stockport, 4s. 6d.; Droylsden, 4s. 6d.; Blackburn, 4s.; and so on—none being below them. The private Act of Parliament gave them power to assess the rate of gas at 5s. 6d. per 1000 cubic feet. And what was the example they had set to their neighbours? In 1852 they reduced it to 5s.; in 1854 to 4s. 6d.; and in 1863 and 1864 to 4s. Now, after this, were they dealing fairly with the public? For a moment see the position of the company in this matter. The Act of Parliament allowed them to take 10 per cent.; and it fixed the capital at £36,000, subject to an authorized addition, which he should show, and also authorized them "that it shall be lawful from time to time to construct, lay down, maintain, alter, or discontinue such retorts, gasometers, drains, sewers, machinery, and other works." That was in section 27 of the special Act. So that the Act of Parliament, saying "you shall not have more than 10 per cent.," said "you shall be able to complete all extensions that become necessary." Otherwise see the effect. They would be tied down with the expenditure of their capital, without being allowed to create increased accommodation for the whole of the increasing district around, and it would be debarring the neighbourhood of the light secured to them by the Act. Now, with reference to the reserve or contingent fund. His friend had said there ought not to be two funds. There were not two, in fact, but as a matter of book-keeping they had been described as two. His friend had also said they had not rendered the annual account. He must, however, say, that they had rendered it particularly careful, and it was in the archives of that court, as directed by the Act of Parliament. Why such things were to be mentioned—unless it was to show that they did all sorts of dirty things to avoid an Act of Parliament—he could not conceive. Now, he thought it would be admitted by every person who knew anything about machinery that there was an annual depreciation, and it would be admitted by every one who had heard him that 1½ per cent. per annum was within the mark of any manufacturer's computation. They had spent, fairly, under the Act of Parliament, £46,000 of capital, and if they took 1½ per cent. from them they would find that it came over £6000, or just within an ace of what they put it at. It might be criticism upon the book-keeping, but they had their whole capital and income in one set of books, and upon the capital they stood thus, nominally—they ought to have the same capital invested in plant as they had 17 years ago. But look at the rust, and the ordinary wear and tear for 17 years, and were they to go to the shareholders and say they had £40,000, which they had spent? The directors, at different meetings, had estimated various sums for wear and tear amounting to £6200, which was the matter of blame against them that day, but it was all actually entered in the books from time to time.

The CHAIRMAN said it seemed to him to be a question of wear and tear.

Mr. EDWARDS said that was so.

The CHAIRMAN observed that they must keep up their plant in the position in which it was.

Mr. HOPWOOD said they only did the same as any prudent manufacturer. A strong case should be shown that they had taken more than 10 per cent. before parties began to move in this matter. The directors had this question of reduction under their consideration, but they could not carry it out in the face of such an imputation on them as seemed to be made by that sort of proceeding.

The CHAIRMAN said the gas company should not be too thin skinned—the public often abused them, and sometimes rightly.

Mr. HOPWOOD observed that with regard to the income-tax the words of the Act were simply that the treasurer for the time being should deduct it. Now, he did pay it. All he (Mr. Hopwood) had to show to the court was that they had not received clear profits beyond 10 per cent. in any one year. If they gave 10 per cent, and deducted, say, 2½ per cent. for income-tax, could it be said they had the clear profits? He submitted that the directors had a perfect right to say that the shareholders should have what the Act of Parliament intended them to have—10 per cent.—but it would not be 10 per cent., if it were 10 per cent. less something else. That could not be contended. Mr. Hopwood contended that during the last two years of bad times they had had to draw upon the reserved fund, and that the court could not make an order to reduce the price of gas unless there was a reserved fund of £4000 invested, and that no reserved fund was invested.

Mr. HIGGIN, in reply, said that the company were not entitled to treat the contingent-fund as a reserved fund or depreciation account, because they had year by year spent out of the reserve large sums in renewals and replacing the wear and tear. In 1859 they spent in this way £1281; in 1860, £1117; in 1861, £1750; in 1862, £4442; in 1863, £427; and in 1864, £290. All these moneys were in addition to the accumulation of the reserved or contingent funds. After some further remarks, in the course of which he asked for a reduction in the price of 1s. per 1000 feet, he said he would suggest that if the court should be of opinion that there was no case made out on the part of the petitioners, the whole thing fell to the ground. If they should be of opinion that there was, then he would wish them to say to what extent, and then let the case be adjourned, in order that the necessary calculations might be made, that they might come before the court.

The CHAIRMAN: We do not think we can interfere with the matter as it is put before us.

Mr. OVENS: In my opinion you have made out no case except for the income-tax. We both think you have made a case out for that, but it is not such a case as would justify us in making any order whatever for reducing the rates, so as to ensure the undertakers a profit, as prescribed by the Act.

Mr. HOPWOOD referred to the charges against the company, and applied for costs.

The CHAIRMAN: We have considered the charges, and we think in this case the company, should pay the costs.

Mr. OVENS (to Mr. Higgin): I, at least, do not decide against you, because we are not satisfied with the accounts of the gas company. Our reason is because we do not think this the proper place where a remedy can be given.

Miscellaneous News.

EUROPEAN GAS COMPANY.

The Annual General Meeting of the Shareholders of this Company was held on Wednesday, July 12, at the Offices of the Company, No. 4, Frederick's Place, Old Jewry—SHEFFIELD NEAVE, Esq., in the chair.

The usual preliminaries having been duly complied with,

The SECRETARY read the report, of which the following is an abstract:—

Amiens.—Increase of lights, 578. The reduction of price, equivalent to 25 per cent., to which your directors were obliged to consent, in order to obtain the exclusive privilege for 50 years now secured to the company, has affected the profits to the extent of £625. The alteration took place at a period of the year when arrangements for winter lighting had already been made by the inhabitants, and has, therefore, not as yet had the effect of increasing the consumption of gas largely; but it may reasonably be expected that, in the course of a few months, a considerable improvement will be exhibited here, as has invariably been the case elsewhere, under similar circumstances; although some time must necessarily elapse before the amount of so important a reduction can be covered by the profits on additional business.

Your directors are taking steps to stimulate the inhabitants to use gas for lighting more generally than was done at the higher price.

An extension of the purifying apparatus, and various modifications on the works, together with the addition of a scrubber and duplicate boilers, engines and exhausters, enclosed in suitable buildings, are required to place this station in a position to supply, under favourable conditions, the anticipated demand for gas. These works are now in progress, and will be completed in the course of the autumn.

Boulogne.—Increase of lights, 1106. The old gasholder has been repaired at a cost of £267, and the works may now be considered in a thoroughly efficient state.

The new gasholder, projected for the present year, may be deferred until next year, without serious inconvenience. In this case, as in every other, the utmost endeavours have been made to husband the resources of the company, and to delay the investment of new capital, so long as it can be done with any degree of prudence.

The authorities and societies co-operating with them are using strenuous exertions to induce large numbers of persons to visit the town, for sea bathing, during the present summer. The effect on this company's interest will doubtless prove very beneficial.

Caen.—Increase of lights, 610. Both the small gasholders, which have been in use since the first formation of the works, have been entirely renewed at an expense of £1400, and your directors have considered it expedient to charge the profits of the year with a large proportion of that sum. The effect is to turn into a decrease the balance which would otherwise have shown a considerable increase.

The trade of the town has somewhat recovered; and the prospects at this station are encouraging.

Your directors look forward confidently to the development of the company's business at a more rapid rate than for some time past.

The works are now of sufficient magnitude to render the establishment of exhausters desirable. All the apparatus and buildings necessary for that purpose are in course of erection.

Havre and St. Adresse.—Increase of lights, 1928. It affords good ground for congratulation that, notwithstanding the reduction of price, which weighs on the accounts to the amount of £832, a satisfactory result should have been already obtained.

Important works have been undertaken by the authorities, and are now in progress for further improving this city. The land available for building purposes is of great extent. Measures will be taken to introduce gas into the greater number of the new constructions.

Nantes.—Increase of lights, 1406. The improvement, which was reported to the last meeting as then in progress, has been continued, and the prospect of further increase appears favourable.

Alterations and repairs have been carried out at an expense of £887, including the amount chargeable for a new chimney erected during the past year. These alterations were rendered necessary by the recent extension of the works, which are now in perfect order, and of capacity sufficient to supply any additional demand for gas likely to arise during several years.

Rouen, Sotteville, and Suburban Districts.—Increase of lights, 697.

At the half-yearly meeting, in February, your directors stated that they could not encourage you to hope that the profits would be greater in amount than those of the previous year.

The revival of activity in the cotton trade which was then taking place, proved to be temporary only, and ceased almost immediately afterwards.

Nearly £3600 has been expended on the renewal of the old gasholder, the reconstruction on improved principles of part of the retort-house, and in making a new quay of sufficient strength to bear the extension of the retort-house now in progress, and any other buildings it may be considered advisable to place there. It is intended to charge the whole of this amount against revenue, and a large instalment has already been written off from the profits of the past year.

The future of this establishment must depend almost entirely on the state of the cotton manufactures, and in the uncertainty which now prevails, it would hardly be advisable to express a decided opinion on the subject; but in the meantime, every preparation has been fully made to meet any considerable increase of business that may suddenly arise.

The outlay for a new gasholder has, however, been deferred until next year.

Summary.—Increase of lights, 6325. That an additional profit should have been obtained, notwithstanding the stagnation in trade, so severely felt in the cities lighted by the company, is satisfactory, and justifies the encouraging language made use of in the previous reports. It is the more gratifying that this has been obtained notwithstanding a charge upon revenue of £1818 on account of the extraordinary renewals and repairs paid for during the past year, and already referred to under the heads of the different establishments. These repairs and improvements will enable the managers to work the stations in which they have been carried out with greater advantage than was possible, whilst dependence had to be placed on old materials and apparatus which length of service had rendered defective and uncertain in action.

The sale of coke has been everywhere effected at an advance on the previous year's average prices, and a continued maintenance of prices may be anticipated.

The supply of coals has been secured on conditions, which, owing to lower freights will create a saving on the cost in 1864 and 1865, although the price at the pit's mouth is now higher than had been the case during the whole of that period.

These favourable circumstances induce your directors to look with confidence to the future. The more so that a point has now been reached when the outlay will be greatly reduced, and when the expenses of wear and tear may also be brought within narrower limits, in consequence of the improved condition of the works.

This was not accomplished without much expense, but the cost will certainly be reproductive in the shape of better returns.

Seeing these encouraging prospects, together with the probability that the rate of increase in the consumption of gas supplied by this company may be expected to improve considerably, your directors venture to recommend the payment of the usual dividend, at the rate of 8 per cent. per annum on both old and new shares, together with a bonus as in former years; but, as this will have to be paid on a recent increase of £30,000 made to the share capital, it will require £2094. 4s. 2d. to be provided from the reserve-fund.

Applications have been invited for debentures bearing 5½ per cent. interest to repay temporary loans, and the amount of £22,559 has been already applied for.

Mr. John Moxon having resigned the office of auditor, to which he was re-elected at the last annual meeting, your directors have acted on the powers conferred on them by clause 96 of the company's regulations to appoint Mr. William Jones Lewis in his stead. He is eligible for election by the shareholders on this occasion, and offers himself accordingly, together with Mr. Felix Ladbroke, the senior auditor.

Notice has also been given that two of your directors (Walter Thomas Fawcett, Esq., and William White, Esq.) retire by rotation, but, being eligible, offer themselves for re-election.

The CHAIRMAN said: Gentlemen, you have heard the report, which has given you the details with regard to each station, and also an outline of the propositions which we have to make to you this day. It would, perhaps, be as well for me, first of all, to carry you back to our meeting at this time last year. It then appeared that we should want £30,000 to go on with, as outlay for extensions, which sum has very nearly been raised, and is in course of being paid by the debentures which have been taken. As we paid a dividend of 10 per cent., we were aware that we should require about £4000 more of profit in order to keep up that rate. The result has proved we are £2000 short of our expectation; and it would be well, therefore, that I should repeat to you what I said in February—that we had a bad autumn, that the increase of business had not corresponded with former years, and it was on the supposition that it would do so that we hoped to have enough to pay you 10 per cent. out of the earnings of the year. But I would take the credit of not having entertained the expectation that we should incease our rental so as to be able to pay 10 per cent. without some solid foundation for it. For six or eight years, the average increase of business has been 11½ per cent.; and if we had only had an increase of 8 per cent., we should still have had enough to have paid you a dividend of 10 per cent. out of the earnings of the year. However, instead of reaching 8 per cent., it has only been 3½, owing to the American War. Our increase has only been £2297 instead of what we anticipated, but I think you will say that there must still be healthy action to produce that gain. Though it is a disappointment not to reach the amount which we hoped under the expectation of prosperity, it is surely a source of congratulation, when we regard our difficulties, that we have only fallen £2094 short. On what? On a sum of £29,406. So that the deficiency, you will see, is a mere bagatelle compared with the earnings of the company. With regard to the question of outlay, I may say that for the last few years we have foreseen that the towns were extending with every appearance of prosperity, if we only took the natural development occasioned by the increase of population. I set aside for the moment the great improvement that must necessarily be occasioned by the increase of wealth, and taking the development of the towns in their population, it was necessary to see that we had sufficient means of supply to meet the growing wants; and I am sure, when you consider the case fairly, you will be of opinion that the enterprise has in it the seeds of great strength, and grounds for great advancement. I would point to the lights as a proof. You have an increase in the year of 6325 lights. That shows that, although the previous lights are not taking as much as they would do under circumstances of commercial prosperity, yet extension is going on. We should have been satisfied if we got less increase in lighting, viewing the state of commerce; and we see a prospect already at Rouen of enlarged activity. They are beginning to work again, as in Manchester and other places; the trade is returning, and we may hope to get back into our former position. If we only do that we shall be satisfied, but at the same time we naturally hope for improvement. The difficulties which now beset us are not to be looked forward to as lasting, because they are not occasioned by any want of enterprise, or any strong-rooted failure of business, but merely by temporary inaction. Under these circumstances, the directors have thought that they might fairly take—in order to keep up the dividend, £2094 from profits which have been already earned, because it is a fund which has been created for the special purpose of equalizing dividends, and making up temporary deficiencies in it. I trust that the proprietors will be of opinion that the directors have done right in following that course.

Mr. THORNTHWAITE: What is the price of gas per 1000 feet?

The CHAIRMAN: It varies at each station. I now move—"That the report be received and adopted."

Mr. LEWIS: I beg to second the motion.

Mr. BULLOCK: Being a holder of new shares, and purchasing them, as I did, some 2½ years ago, at a premium of 3⅜, I have found my holding a very unsatisfactory one for two years, because I believe they have paid me about 3¼ or 3½ per cent., whilst the Bank of England was charging from 9 to 10 per cent. Finding that the directors were asking for £30,000, and offering 5½ per cent. upon debentures, it appeared to me rather remarkable that they should not have made an additional call upon the new shares. The question occurred to me whether it was right to pay 5½ per cent. on debentures, when the new shares were only paid up to the amount of £5. I thought the new shares ought to be put on the same footing as the old ones. The Western Gas Company have acted upon that principle.

Mr. WHITE (a director): So have we, in this company.

The CHAIRMAN: We, as the directors, have the duty imposed upon us of conducting the finance of this company as cheaply as we can for the benefit of the proprietors. You have had the same interest as other shareholders upon the amount of capital which you have paid. The reason why we do not come upon you and call for more money is that we find we can do better for the company by raising what we want without making the call to which you refer.

The resolution for the adoption of the report was then put, and carried unanimously.

A resolution authorizing the payment of a dividend at the rate of 8 per cent. per annum on the old and new shares, together with a bonus of 4s. per share on the old shares, and 2s. per share on the new shares, free of income-tax, was carried unanimously.

The retiring directors were then re-elected.

Mr. FAWCETT, in returning thanks, said: Gentlemen, I thank you for the honour which you have done me in re-electing me as one of your directors. Being the youngest of the directors, I may be allowed to say of my colleagues, that ever since I have had the honour of a seat at this board, I have found that the business has been conducted in such a manner as to give me the most entire satisfaction. I have had the duty in my rotation to visit the stations of the company, and in so doing, having some knowledge of gas matters, I may say that the arrangements which the directors had previously made were such as to be the means of placing this company on a most satisfactory and permanent footing, conducing to success, and I have no doubt that we have a very bright future before us.

The CHAIRMAN: Before Mr. White rises, I would just inform the meeting that he has this year been all round the stations, and has only just returned. Those are self-imposed duties of the directors, who leave their business for three weeks, at a pecuniary sacrifice to themselves, in order to visit the stations.

Mr. WHITE: Gentlemen, I can only say that I am very much obliged to you for the handsome manner in which you have re-elected me. I have had the honour and pleasure of serving you for 17 years, and I have done so to the best of my abilities. It was not exactly in my turn, but as one of my brother directors was not well enough to go, I visited the stations, with our worthy secretary, Mr. Backler. We went, as we always do at this time of the year, through every item of every account which is connected with the working of the stations. There was not a single one which was not thoroughly examined. You may be perfectly assured that there is nothing in the accounts which is not more than represented. With regard to the working, we found, of course, in large establishments that there was a screw loose here and there; but, taken as a whole, the operations were never more satisfactorily conducted than they are now. The times have been rather against us, but if our business keeps increasing, as I have no doubt it will, I am sure we shall be able to place before you at the next half-yearly meeting a very satisfactory report. I am satisfied that, as far as the directors are concerned, they will do all that in them lies to bring about such a result.

The auditors having been re-elected,

Mr. W. J. LEWIS responded, and said: I am much obliged to you, gentlemen, for the appointment you have made, and can only say that it will be my duty to pay every attention to the company's affairs. I may add, that I have had the greatest satisfaction in finding that our worthy secretary, whose services I have had the pleasure sometimes of noticing here, has afforded us every possible opportunity of testing the accounts, and that he has been most frank and ready to answer every question which has been put to him.

Mr. STOKES said: I have much pleasure in moving a vote of thanks to our worthy chairman. I have attended these meetings for some years, and am thoroughly satisfied with the way in which things are proceeding.

The Hon. R. H. BROWNE: I have very great pleasure in seconding the motion, which the honourable proprietor has just placed before the meeting, because I am thoroughly satisfied that the directors of this company do all in their power to make it successful. The resolution passed unanimously.

The CHAIRMAN: Gentlemen, in the name of my colleagues and myself, allow me to return you our sincere thanks for the complimentary resolution which you have just now passed. We have, really, received such repeated favours at your hands, that it would be better for me perhaps to stereotype what I have to say. I can only add, that, if we have done well hitherto, we shall so continue to act in the future.

Mr. WHITE: Gentlemen, I find by the minutes which have been read that I moved a vote of thanks to the secretary at the last meeting, and I shall be very glad to do so to day. No man in the room is more able to appreciate his good services than I. I went with him round the stations for three weeks or a month, and I can say without hesitation, that no company could have a better secretary than we have got. You may rest assured that by his good management he keeps everything in the right place.

Mr. AGER: I beg to second that motion.

The resolution was carried *nem. dis.*

Mr. BACKLER: I am exceedingly obliged to Mr. White, and to you, gentlemen, for the very kind way in which you have passed this vote of thanks to me, and I can only add that I find my pleasure in performing my duty. Therefore, it is no hard task imposed upon me; I need not say I am very glad when I see the company progressing, as I have every reason to expect it will continue to do for many years, until eventually we shall bring it into a more prosperous condition than it has ever been in yet. I can assure you that nothing I and my brother officers can do will be wanting to attain that object, which I keep constantly in view.

METROPOLITAN BOARD OF WORKS.

FRIDAY, MAY 19.

The usual Meeting of the Metropolitan Board of Works was held this day at the Office in Spring Gardens—Sir JOHN THWAITES in the chair.

THE NUISANCES AT BARKING AND CROSSNESS OUTFALL SEWERS.

At the meeting of the board held on the 28th ult., the chairman drew attention to the great nuisances and offensive exhalations from certain manufactories on both sides of the river, near the outfall works, which were most injurious to the health of the officers employed at those outfalls by the board. Some persons had erroneously attributed those odours to the discharge of the sewage at those outfalls; and he suggested that with a view of removing that false impression, and also to consider whether any steps could be taken to remove the nuisance, that the engineer should specially report upon the subject.

This suggestion was agreed to, with the addition that Dr. Letheby should be associated with him in the investigation, and that they should make a joint report. That report was this day presented, and it was as follows:—

To the Metropolitan Board of Works.

Gentlemen,—In compliance with your minute of the 28th of April last, that it be referred to the engineer to report on the nuisances arising from certain works and manufactures carried on near the outlets at Barking Creek and Crossness Point, and that Dr. Letheby be requested to assist the engineer in the investigation, and that the engineer and Dr. Letheby do report any suggestions for the purpose of abating the nuisance, we have visited and inspected the manufactories in the neighbourhood at or near the sewer outfalls; and we have to report as follows:—

In close proximity to the northern outfall, and on the east side of Barking Creek, are the manure and vitriol works of Mr. Lawes. The most important operations of these works are the manufacture of a manure called superphosphate of lime. It is effected by a continuous mixture of oil of vitriol with ground coprolites and crushed bones, there being evolved a large volume of acid vapour and gas, which escapes freely into the atmosphere. There are short wooden shafts, which pass from the receiving-chambers through the roof of the factory. At the time of our visit we were informed that about 80 tons of manure were manufactured daily; and as far as we could perceive, there were no contrivances whatever in use for the absorption or neutralization of the evolved vapours and gases; in consequence of which, the atmosphere is polluted at a great distance from the works.

The manufacture of oil of vitriol is carried on to the extent of about tons per week. It is effected by the combustion of the sulphur in Spanish pyrites and in the spent oxide of iron from gas-works; but although at times there may be an escape of acid vapours from the building, yet it is not generally so offensive as the manufacture of superphosphate of lime.

On the same side of the river, and at a short distance from the works of Mr. Lawes, are those of Mr. Crew, where, we were informed, the gas liquor and gas tar is subjected to decomposition—the former being converted into sulphate of ammonia, and the latter into naphtha, creosote, and pitch.

During the saturation of the ammoniacal liquor with sulphuric acid, in forming the sulphate of ammonia, a large quantity of sulphuretted hydrogen is set free; and when this escapes into the air, it is a cause of great offence, and may be recognized at a considerable distance from the works.

The process of distilling the coal tar is also to some extent offensive; but it is not nearly so serious in this respect as the preceding.

On the south bank of the Thames, about half a mile below the southern outfall, is a place called Belvedere, where there are two manufactories for the utilization of the London tanneries. One of them belongs to Messrs. Prockter and Bevington, and the other to Mr. Brown.

At the first-named factory, the material called "scutch," which is a scraping of hides and skins, is converted into manure by boiling it for several hours with a weak solution of oil of vitriol and it is then run off into open pits, where it consolidates by evaporation and by the soakage of the liquid portion of it into the ground. This soakage finds its way into an open ditch, from which it is discharged into the river by means of the sluices, at the time of low tide.

We remarked that there was a large accumulation of scutch and manure upon the works, both of which were evolving most offensive effluvia. There were four coppers for the manufacture of this manure, and three of them were at work—each copper being capable of holding a charge of nearly two tons. The vapours emitted from the boiling mixture are so offensive that it is found necessary to guard the workmen against their action by having wooden heads to the boilers, communicating with a short shaft or flue, which carries the vapours out of the building into the open air, and as a further precaution, the roof of the building is loosely covered with tiles. The effluvium from these works was, at the time of our visit, remarkably offensive;

and we have no doubt that in the warmer weather, when the scutch is in a putrefying state, the odour must be still more disgusting, and must be perceived at a considerable distance from the works.

Adjoining the preceding works, are those of Mr. Brown, which are devoted to the manufacture of glue from the trimming of hides and skins, and to the manufacture of manure from the general refuse of tanneries; besides which there is a considerable manufacture of oil of vitriol. The principal material received at the works is the clippings of skins. These are soaked for about twenty-four hours in water contained in large open pits. The clippings are then boiled for many hours in water, with a little sulphuric acid. By these means they are in a great part dissolved and converted into glue or size, which is further concentrated in the boilers. At the time of our visit, we found four large vats, about two tons capacity, in full work, and the vapours evolved from them were, as in the last case, peculiarly offensive. There was no contrivance whatever for the condensation of these vapours, but they were permitted to escape very freely through the open roof of loose tiles.

All the insoluble matters of the preceding operations, as well as the horns and other refuse of the tanneries, were, as at Messrs. Prockter and Bevington's works, converted into manure by boiling with weak sulphuric acid, and the manure was received into open pits, where it consolidates in the way already mentioned.

Lastly, the manufacture of sulphuric acid was effected by the combustion of crude sulphur; but, except at certain times, this operation did not appear to be seriously offensive.

On the other side of the Thames, and almost immediately opposite to the southern outfall, we found the newly erected works of Mr. Robert Hewitt. They are being constructed for the distillation of bone oil, which is a very offensive product of the burning or rather carbonization of bones in making animal charcoal. It is difficult to say, in the present state of the works, what may be their future condition; but if precautions are not taken in the distillation of the oil, they will be a very serious nuisance.

The results of these inspections are that large and very offensive operations are carried on in the neighbourhood both of the northern and southern outfalls, and that the putrid and other matters emitted from the works are diffused into the atmosphere and wafted to a considerable distance.

The two points which presented themselves to our consideration were, first, that these vapours coming from the neighbourhood of the outfalls must naturally be erroneously attributed to the sewage; and secondly, that the effluvium from neighbouring factories may be a serious nuisance to the workpeople who will have to reside at the drainage outfalls. It is therefore of great importance that the character of these vapours should be identified, and that no false opinion should be entertained of them in connexion with the sewage from these outfalls.

The locality of these manufactories appears to be as well suited for such operations as any within easy reach from London; but it is a serious question whether in any locality the manufacturers are not bound to use every precaution in the conduct of their works, so as to prevent as far as possible the escape of noxious effluvia into the atmosphere. In the present instance, there is no doubt that no precautions whatever are in use, but, on the contrary, the vapours evolved from the materials, in all stages of the manufacture, are permitted to escape freely into the atmosphere. —We have the honour to remain, gentlemen, your obedient servants,

H. Letheby,
May 13, 1865. J. W. Bazalgette.

Mr. Brooker said that he had no doubt every word of the report could be fully borne out by the inhabitants; and he produced a letter sent to him from Belvedere, complaining of these places, although they were nearly two miles off.

The Chairman said perhaps the board would direct that the report should be printed and referred to the Main Drainage Committee, for the purpose of taking any steps they might deem necessary for the purpose of abating the nuisance.

Mr. Freeman suggested in the meantime the solicitor should ascertain what legal powers the board might have to enable them to abate the nuisance. They had power over soap and candle factories, and they could be called upon to destroy their noxious vapours; and he hoped they had powers to put an end to these nuisances.

Mr. Newton said both of these places were beyond their district.

The Chairman said that they were near to their works; but that was a question they had better then not go into.

Mr. Collinson: Will the report go on to the minutes?

The Chairman: Oh, yes.

The motion was then put that the report be referred to the Main Drainage Committee, and that they be empowered to take such steps as may be necessary to abate the nuisance.

This was agreed to, and so for the present the matter terminated.

METROPOLIS GAS SUPPLY.

MEETING IN BERMONDSEY.

On Tuesday evening, the 11th instant, a Meeting of the Parishioners of Bermondsey was held in the Board-room of the Parochial Offices, Russell Street, Bermondsey, to take into consideration the propriety of adopting measures to secure an improvement in the quality and a reduction in the price of the gas supplied to the parish. The meeting had been convened by the two churchwardens on a requisition signed by a large number of the parishioners. The meeting did not commence till twenty minutes after the time announced, but by that time there was a goodly attendance, and amongst those present were—Messrs. Youngman, Redgrave, Elworthy, Mitchell, Reardon, Stratford, W. H. Jones, A. Smith, T. Parker, Poulton, Slee, Riley, Bishop, E. D. Rogers (of Camberwell), and Rendle (of St. John's, Horsleydown).

Mr. Churchwarden Youngman was voted to the chair, and he said he and his colleague having received the requisition, he immediately applied to the Guardians for the use of that room for holding the meeting, which was readily granted. They then at once convened the meeting, and the business was now in the hands of those who were present.

Mr. Rendle was present by the special invitation of the requisitionists, and not as an inhabitant of Bermondsey, as he did not reside in the parish. The invitation was given to him because he had taken an interest in this question, and had been appointed a deputation from the adjoining parish to meet other delegates appointed by different London parishes to consider the question of the supply of gas, and the price charged for the same. In his capacity as delegate he had attended the meeting at Guildhall on that subject, and had subsequently made a statement to a meeting of his own parishioners in relation to the matter. The statements made at Guildhall had not been contradicted, and, therefore, he apprehended they were true in the main; but he could of his own knowledge affirm that the Surrey Consumers Gas Company supplied bad gas, and at a very dear rate. Some time since the Surrey Consumers Company charged 4s. per 1000 feet, but when coals increased in price they raised the price to 4s. 6d.; but this had not been reduced since coal had again decreased in price. Mr. Flintoff had shown that the influence exercised by the price of coal on the price of gas was very small, because as coal increased in price, so also did the price of the products of gas manufacture increase also. At Newcastle coals were delivered at 6s. per ton, and in London the price was 14s. 3d.; but in Newcastle the products were worth 3s. 3s., and in London 11s. Deducting, therefore, the 11s., the cost of the gas was 3s. 3d. in London, and deducting the 3s. 3d in Newcastle, the real cost of the gas there was 2s. 9d., showing that the only difference per ton of coal consumed was 6d. in favour of Newcastle, or ½d. per 1000 feet. A ton of coal would produce between 9000 and 10,000 cubic feet of gas, and there was very little variability in the products of the same kind of coal from time to time. The other products were 13 cwts. of coke (variable in value), 10 gallons each of tar and ammonia (both articles of value), and now the absolute refuse of gas-works was of great value, though formerly it cost money to remove it. Some of the most beautiful dyes were produced from this refuse. Mauve and some other colours were most fleeting and fading when produced from vegetable substances, but the contrary was the case when produced from this refuse. There was, however, produced also from this refuse, which in its ordinary state was so offensive and useless, the most beautiful essences and fruit perfumes. Thus, the pineapple flavour, Dr. Letheby said, was so produced, and it was impossible to say whether it came from the pineapple or the gas refuse. The value of these products reduced the cost of coal for the production of gas to 3d. or 4d. per 1000 feet. Gas was sold per 1000 feet at 2s. at Whitehaven; 2s. 4d. at Bradford; 3s. at Newcastle; 2s. 8d. at Walsall; 3s. 3d. at Cardiff; 3s. at Nottingham; 2s. 7d. at Birmingham; 3s. 8d. in one part of South London; 2s. 9d. at Plymouth; and 4s. 6d. in the City and some parts of South London. Liverpool and Manchester were supplied with cannel gas, which, compared with common gas, was as 5 to 3—that is, it was worth 5s. per 1000 feet, when common gas was worth 3s. In those two places it was, however, sold at 3s. 2d. only. In Manchester the gas was made by the corporation, and £28,000 had been spent on improvements out of the profits arising from its sale, and yet the price of the gas was only 3s. 2d. One word as to the price of coals at Whitehaven. They were 7s. 9d. per ton; the products realized 6s. 2d. and the cost of the gas per ton of coal there was thus 1s. 5d., while at Plymouth the cost of coal was 14s. 9d.; the value of the products, 9s. 8d., leaving the cost of the gas as 5s. 1d. As to London and Newcastle, he had already stated the facts. From these statements he thought Mr. Flintoff's affirmation that gas could be supplied in London at 2s. 9d. per 1000 feet had been fully borne out. They should now apply these facts to their own circumstances. He then spoke of a similar agitation to the present having been in existence some six or seven years since, which resulted in an application for an Act to protect alike the producer and consumer. The Act was obtained and was known as the Act of 1860. The gas interest was so strong in the House of Commons that the Act, instead of being any value to the consumer, was really valuable only to the producer. The result of the Act was the introduction of the system of monopoly, and as a counterbalance to the benefit thus given to the producer every consumer was to have had a constant supply, it being provided that only a reasonable price should be charged, and that the quality should be good. The supply was to be provided subject only to the condition that the consumer complied with the terms specified in the Act; and a maximum price was fixed and provision made for the gas to be tested. A clause, however, was introduced, rendering it optional on the company to lay on the supply if the place where it was required was 50 yards from the main, enabling the company to require an agreement from the consumer to take the gas for two years, and laying the consumer under the obligation of paying 20 per cent. of the cost of laying on the gas. There was also a provision that the price of gas should be reduced whenever the dividend exceeded 10 per cent., but a clause was introduced enabling the company to make up their back dividends for a certain number of years to 10 per cent. before there was any reduction in the prices. The other companies had since reduced the price, but not the Consumers Company, and the promise of a reduction was in the far-off vista of years to come. Making the price depend upon the dividend was the way to lead to extravagance, and the result was that any peculation or embezzlement would all come out of the consumers pockets, and not out of the producers. It was impossible for any one without a scientific apparatus to test whether the gas was up to the parliamentary standard, and thus the test at the works showed the gas was up to the standard while everybody complained of its badness, so that either the standard was too low or there was some juggle. The apparatus in St. John's had cost £100, but it had been useless to the consumers, while it had been most valuable to the companies. Instead of the original provision, that the gas should be tested where it was consumed, being allowed to remain undisturbed, a clause was introduced for the gas to be tested within 1000 yards of the works, it being well known that beyond that distance the gas deteriorated in quality. These were the advantages obtained by the consumers as corresponding to the benefits conferred upon the producers by the districting arrangements. At the Guildhall meeting it had been resolved to seek for powers to enable the City to make gas for themselves, and to get rid of this objectionable Act. The resolution he was about to propose was not couched in terms antagonistic to the companies, but proposed to appeal to them to reduce the price of gas, and he hoped they might get the reduction. As to starting a new company, the Surrey Consumers Company was started on the very principles that such a company must be originated. The breach of faith, however, on the part of those who promised to support that company, had compelled it to amalgamate with the other companies. It was, therefore, useless to talk of starting a new company, as just the same thing would happen now as happened then. He was afraid also it was useless to talk of abstaining for a time from burning gas. It would be well, however, to get the Act of 1860 repealed and then to imitate the City in getting power to manufacture their own gas, though it was questionable whether it would be wise to exercise such a power. He rather, however, approved of the plan of power being given to parishes to buy up all mains in their districts, and then they could contract for the supply of gas through one large culvert into the main that was to supply their respective districts. Thus there would be combined all the advantages both of monopoly and free trade. He then moved that the price charged by the Surrey Consumers Company for the gas supplied by them was both exorbitant and unjustifiable.

Mr. Ernes seconded the motion, saying they had received much valuable information, that the gas was unquestionably bad in quality and high in price, but he questioned whether many of the suggestions thrown out could be carried into effect, or whether they would be advantageous if they were in operation.

Mr. E. D. Rogers alluded to the gas being so bad that the emanations from it were so foul as to injure tradesmen's goods, and that all kinds of contrivances were needed to enable them to obtain light enough to exhibit their goods. There was also a very loose system of charging for gas, so that very different amounts would be charged at different times for the same quantity of gas. Mr. Flintoff acknowledged that he was a paid lecturer, and he held a meeting in the City after a resolution had been passed to make their own gas, and so none of the 2000 consumers there attended it, the resolutions being moved and seconded by paid officers of the society he belonged to. The City acted for itself, and that was what he wanted Bermondsey and every other locality to do also. There must be more energy and enthusiasm evinced, and no dependence upon paid lecturers, agents, or canvassers if there were to be success, for as it was the companies were laughing at them. It was true that when the Surrey Consumers Company was started hundreds of consumers, instead of fulfilling their promises, continued to take their gas from the Phœnix when they re-

duced the price. A new company would be useless, for the same result would be sure to follow its formation as followed the formation of the Surrey Consumers Company. There were some beneficial provisions in the Act of 1860, which would have been felt if the officials had done their duty. Thus the company were liable to penalties if the gas was inferior in quality or illuminating power. That which affected the price of gas was capital. The difference in the price of the three companies (the Phœnix, the South Metropolitan, and the Surrey Consumers) arose from the operation of the Act. The works of the South Metropolitan Company being more modern than those of the Phœnix, they were the sooner able to pay up the back dividends of 10 per cent., and so to reduce the price of gas. There were 58 towns in England where the corporations or public companies supplied the gas, which was mostly superior to and cheaper than London gas. In Manchester last year £56,000 were paid in reduction of the rates out of the profits arising from the sale of gas. After alluding to the immense profits realized by the gas companies, he asked, if Mr. Croll could under contract supply gas to the Surrey Consumers Company, why could other parties not do the same as to the parishes? The average price of coal was 16s., and the gas produced from it was sold in this locality for £2. 0s. 6d., and the products were worth 8s. The charge here was £4. 5s. per lamp per annum for the public lights, and in 1823 it was only £5. 5s., while in 1853 it was £2. 19s. 6d.; but now, with all the improvements in manufacture, it stood at the above-named price. The Birmingham Company could pay a good dividend by making coke only, and allowing the gas to escape. The mode of testing gas was a farce, and he had told Dr. Letheby so, who merely replied that he tested it according to the provisions of the Act of Parliament. He asked the assistance of the parish to the agitation now commenced in the south of London, and said there must be some subscription, however slight, to carry out the agitation successfully.

Mr. A. Hill stated that some years since he paid £14. 18s. for a quarter's supply of gas, his workpeople being engaged from six in the morning till midnight, while last quarter working only ordinary hours and burning less gas, the charge was £19. He had, therefore, had the gas cut off, as he would not be humbugged any longed. His present light by means of lamps was better than that he had from the gas, and it only cost one farthing per hour per lamp.

Mr. Rendle wished to inform the meeting that he was not a paid agent, and took Mr. Flintoff's statements without asking whether he was a paid agent or not, inquiring only as to their truth.

The Chairman and several gentlemen present said they did not understand the remarks of Mr. Rogers to apply to Mr. Rendle.

The motion was carried unanimously.

Mr. Redgrave moved that a deputation be appointed to wait on the Surrey Consumers Gas Company to request a reduction in the price of gas. Every consumer could say that the cost of gas increased quarter by quarter for the same amount of gas consumed. In the workhouse adjoining this was the case; and in this there could be no mistake, as the same lights were used year after year, being lighted and put at precisely the same hours. Bermondsey, unlike the City, had an Act by which it could make its own gas, although it could not sell it to tradesmen. He would say erect the works and supply the public lamps, and then sell them under the condition that the public lamps and the private lights were to be supplied upon certain terms. Every one should come forward to help to remedy the present state of things. The gas was abominably bad, and he had burnt gas at 6s. 6d. which was 50 per cent. cheaper than that they were now supplied with.

Dr. Dixon seconded the motion, although he expected but little to come from it. They must, however, be in the fashion, which was to adopt a conciliatory policy. Some good would be effected, which would be ascertaining whether there was any sound reason for charging 25 per cent. more than any other company; and if they had not any such reason, then the parish would be strengthened in any application they might make to Parliament. Bermondsey was charged so low for its public lamps because of its local Act enabling it to erect private gas-works. He also made some remarks confirmatory of the statements as to the gradually increasing cost of gas.

Mr. Bishop thought if a little pressure was put on the company by deputations from all the parishes supplied by them there would be a reduction in the price of gas. If this result was not accomplished, then some other steps could be taken.

Mr. Stratford, on being asked if he would join the deputation, said he would not, for the reduction to 2s. even would not satisfy him, as the gas supplied last Saturday would have been dear at 1s., as it was worth nothing at all.

The motion was carried, and the following gentlemen were appointed as the deputation:—viz., Messrs. Youngman, Slee, Redgrave, E. D. Rogers, Bishop, Rendle, Battersby, Smith, and Ernes.

Mr. Ernes pointed out that the fight they were entering upon was one with a monopoly, and that to carry it out successfully there must be combination, and so he moved that the parishes supplied by the Surrey Consumers Gas Company be invited to co-operate with this parish in carrying out the objects of this meeting.

Mr. Slee seconded the motion, which was adopted.

Thanks were given to Mr. Rendle and Mr. Rogers for their attendance and clear and lucid statements, and to the churchwardens for having convened the meeting so promptly, and to the chairman for his ability and courtesy in presiding.

The meeting then adjourned.

THE NEW MEMBER FOR NEWCASTLE-ON-TYNE.

(From the *Northern Express.*)

When a gentleman comes before a large constituency as a candidate for the honour of representing them in Parliament, it is natural to inquire who is he, and what are his claims to the distinction which he covets? We must admit, however, that there is not much necessity for putting such a question in the case of Mr. Alderman Cowen, who presents himself as a candidate, backed by a requisition signed by upwards of two thousand electors. We all know "the man and his communication."

Mr. Joseph Cowen, of Stella Hall, is a few weeks younger than the present century, having been born on the 10th of February, 1800. He is consequently 65 years of age. Mr. Cowen's career through life has been one of ceaseless activity, and he has had the good sense to confine himself for the most part to questions of practical utility. He is no political dreamer of sentimentalist, but a man of earnest business habits and pursuits. He began life by toiling at the anvil at Winlaton, but as in the case of Elihu Burritt, "the learned blacksmith," the sparks from his anvil have had a wider range than the smithy of his native village. Having released himself from the drudgery of that occupation he became a fire-brick manufacturer at Blaydon Burn, a place not far distant from Winlaton, and his gas-retorts and other fabrics in fire-clay became famous in many parts of the world where these articles are in use. At the two great International Exhibitions of 1851 and 1862, Mr. Cowen obtained prizes in his department of manufacture. While thus engaged in building up his private fortune, Mr. Cowen was not inattentive to public affairs. He was early known as a political reformer, though in the most exciting periods of political agitation he never appears to have committed himself by the expression of extreme opinions, or by a line of action having a revolutionary tendency. During the excitement of reform, no part of the county of Durham contained men of more ardent and determined spirit than Winlaton; but Mr. Cowen, whose position and character gave him a commanding influence, exercised a wise restraint on his more ardent followers, and was careful not to overstep the bounds of moderation in the advocacy of his views. The effect of this was visible in the general esteem in which he was held by his brother reformers. The late Earl of Durham honoured Mr. Cowen with special marks of attention, and welcomed him as a coadjutor whenever a gathering of reformers took place at Lambton Castle. In the great contest for the representation of North Durham in 1837, Mr. Cowen laboured to secure the return of the two Liberal candidates; and last year, he had the satisfaction of nominating Sir Hedworth Williamson to fill the vacancy in the representation caused by the lamented death of Lord Adolphus Vane Tempest. Mr. Cowen's practical turn of mind led him to take a lively interest in the administration of the Poor Law. The Gateshead Board of Guardians elected him as their chairman, and for upwards of thirteen years he administered the business of the board with diligence and ability. His popularity as chairman of the union was evinced by a public dinner, given in his honour, at the Grey Horse Inn, Gateshead. Mr. G. H. Ramsay, a county magistrate, presided on the occasion, and most of the gentlemen in Gateshead and the neighbourhood, distinguished for talent or public spirit, were present at the banquet to testify their esteem for Mr. Cowen. The events which have served more than any other to bring Mr. Cowen prominently before the public eye have unquestionably been those connected with the conservancy of the river Tyne, and in none have his straightforward purpose and consistency of character shone more conspicuously. When in 1850 steps were taken to transfer the jurisdiction of the Tyne from a committee of the Newcastle Corporation to representatives of all the principal towns situate on the banks of the river, Mr. Cowen was found an active promoter of the change, but as a manufacturer whose interests were centred in the upper reaches of the Tyne, he very naturally opposed the extreme views of the Shields party. In this respect his interests coincided with his convictions of what was right and just, and he warmly and ably contended before a committee of the House of Commons for a representation of the whole river, and not of one particular section. When this important measure was carried, Mr. Cowen was appointed one of the four life commissioners of the newly constituted board; and from the date of his appointment he has never ceased to advocate and support those measures of improvement which have already given to the trade of our noble river such vastly increased capabilities, and from which further important results are confidently anticipated. The first chairman of the River Tyne Commission was the late Mr. G. T. Dunn. He held the office only for a year, and his successor, Mr. W. R. Hunter, also held the chairmanship for only a brief period. In November, 1853, Mr. Cowen was appointed to that important office, and every succeeding year has witnessed his re-election. In the summer of 1854 he laid the foundation-stone of both the piers, which are now being carried out at the mouth of the harbour, the corporations of all the four towns on the banks of the Tyne being present on that interesting occasion—and in the autumn of the same year he laid the foundation-stone of the Northumberland Dock. The project of a dock at the Low Lights has long been a favourite one with our friends at North Shields; and any works of that kind executed higher up the river, have been viewed with some degree of jealousy by those who fancied that the entrance to the harbour ought to have the first and chief attention. Mr. Cowen, however, has always laid down the principle and acted upon it, that the improvement of the harbour, as a whole, should be steadily kept in view. The piers having been commenced in 1854, it was urged that the formation of a deep water dock at the Low Lights should take place contemporaneously with those works, and because this was not done, certain disaffected parties complained to the Government that the lately appointed River Commissioners were unfaithful to their trust. The consequence was that in 1855 a Royal Commission was appointed to inquire into the matter. Its sittings were held in Newcastle, and the result was that in their report the commissioners approved of the general policy of the Tyne Conservators, dissenting from all the views of the promoters of the inquiry, and expressed a hope that those "local jealousies and animosities" which had hitherto prevailed at the board would be buried in oblivion. In the latter part of 1855, Mr. Cowen was elected a member of the Town Council, for St. John's Ward. In the council, at that time, advocates were found for the immediate formation of the Low Lights Dock, and Mr. Cowen very forcibly urged the propriety of waiting to see the effect of the new piers before commencing a work of such magnitude so near the mouth of the harbour. Those who interpreted these prudent counsels as mere pretexts for delay, had their doubts pleasingly and effectually dissipated, when on the 23rd of June, 1864, Mr. Cowen, as chairman of the river commission, laid the foundation-stone of the Low Lights Dock. He never made a more effective speech than that which he delivered at the banquet, held in the Albion Rooms, immediately after the ceremony of laying the stone. In a very happy manner, he showed that the proceedings in regard to the projected dock had followed in very natural sequence, illustrating the converse of a well-known aphorism, that "delays are not always dangerous." On the 26th of February, 1864, Mr. Cowen was elected an alderman of the Newcastle Corporation in the place of the late Dr. Headlam. A few months afterwards a further honour awaited him. A movement was initiated by the inhabitants of Blaydon for obtaining by public subscription, a portrait of Mr. Cowen to adorn the lecture hall of the Blaydon and Stella Mechanics Institution. The number of those who sent contributions rendered an extension of the original design necessary. It was then determined to have two portraits painted, one to be presented to Mr. Cowen himself, and the other to the Mechanics Institution. Mr. H. H. Emmerson, a local artist of great merit, was commissioned to paint both portraits. The presentation to Mr. Cowen took place at Stella Hall.

Mr. Cowen is a justice of the peace for the county of Durham. At the election of 1859 he was requested by an influential section of the electors to present himself as a cadidate for the representation of Newcastle, but he modestly declined in a letter publicly addressed to the electors. He took part in the election by nominating Mr. Headlam.

ON THE FLAME OF CERTAN CARBURETTED GASES, AND IN PARTICULAR THAT OF ACETYLENE AND CYANOGEN.

By M. A. Morren.

[Extracted from an article inserted in the *Annales de Chimie et de Physique*, May, 1865.]

The study of the combustion of the carburetted gases has for a long time preoccupied the attention of chemists and inquirers into physical science. If we examine with care the flame of a candle and that of the carburetted hydrogen, it will be seen to be composed of different parts; the base near the

wick, or near the burner from whence the gas escapes, is of a dark blue colour; above this an interior cone, which is obscure, rises; then a lateral envelope, which is very brilliant, succeeds, and it proceeds from the blue base and terminates by gradually losing its light at the extremity of the flame: then, and lastly, this is succeeded by an envelope that is little luminous in its character, which starts from the blue part of the flame, and continues to the upper part thereof.

Some chemists, and we will cite here only Messrs. Pelouzé and Frémy, are very cautious in their appreciation of the nature of the blue part of the base of the flame. They simply say that it is formed by the combustible vapour whose temperature is not sufficiently raised to allow it to burn with ease. What is this combustible vapour, particularly when the substance that produces it cannot vaporize without being decomposed? These authorities do not say what it is; they mean, without doubt, that it is a carburet of hydrogen.

Other chemists, and amongst them we will cite M. Mitscherlich, are more explicit. "The blue colour of the flame is due to the fact of the current of cold air diminishing a little the temperature of this part of the flame; the combustion on the exterior takes place less easily, the carbon only half burns, and produces the oxide of carbon. The middle part of the flame, though very luminous, does not get the same amount of heat as the exterior part, because of the two elements that constitute it; the more combustible one —the hydrogen—burns, but the carbon does not." It is very hard to accept this explanation, as we shall have occasion to see; it rests, moreover, upon an incorrect statement of facts, in so far as the occurrence of the blue part of the flame is concerned.

In the first place, we may observe that there is around this part, as well in the lower part of the flame as in the upper, and in the contours of it, an envelope of hydrogen. More than this, the dimension of the envelope is greater around the blue base of the flame; nothing is easier than to convince oneself of this fact or than to see it. The eye cannot, particularly in the neighbourhood of the brilliant part, distinguish the flame of the hydrogen burning alone and pure, which is but little luminous; but it can easily be rendered visible by a little care and pains. It would suffice to dip a thread—or, better, a bundle of threads—of platinum in a highly concentrated solution of salts of copper, strontium, or barium; the ammoniacal protochloride of copper, the chloride of strontium, and, above all, the chloride of baryta, answer exceedingly well. These threads are dried with precaution, then they are approached to the candle, and when the experiment is made it will suffice to touch a point of the external flame that is almost invisible to cause a magnificent blue, green, or red colour to appear, not only at the point touched, but descending and invading all the contour of the candle, thus rendering visible the previously imperceptible layer of hydrogen. The diameter of the flame is also almost doubled in this manner, and it is easy to see that this layer, that protects the oxygen from the contact of the air, which it absorbs for its own combustion, is abundant, particularly at the base and at the lower part of the flame. As a further means of checking the correctness of the experiment, if a fine thread of platinum be taken and moved round the candle, it will become incandescent, as well around as below the blue base, and the highest parts of the flame; consequently the blue base is not chilled by the arrival of the cold air, inasmuch as the hydrogen which surrounds it is burning. It may also be observed that when the flame is rather long and smoky, the layer of hydrogen is not abundant, and does not continue to the summit. This circumstance may always be met with in the carburets, which are relatively poor in hydrogen and very rich in carbon. Thus, for instance, the vapour of turpentine, burns with a smoky flame, and this circumstance may be observed to disappear when a current, duly regulated, of hydrogen is introduced in the middle of this liquid in a state of combustion. If, instead of this liquid in combustion, a current of the vapour of turpentine be taken, the flame will cease to be smoky when the jet of hydrogen arrives at the middle of it. For this reason, therefore, the ancient theory of flame cannot be any longer entertained; we shall see hereafter that it is invalidated by other appearances, and we will show in what circumstances it ought to be modified.

Amongst the motives that have led to the belief that the lower part of the flame was composed of the oxide of carbon, the blue colour has, without doubt, been a determining one; but it is not alone the oxide of carbon that burns with a blue flame, protocarbonate of hydrogen being a case in point. To convince ourselves of this, it will suffice to consult the spectrum analysis, that is so sure in this kind of investigation. If in this way the blue flame of the oxide of carbon be examined directly, it will be seen that its spectrum has no analogy with that of the flame; it is continuous, and nearly without any ray. If the spectrum of the protocarbonate of hydrogen be subjected to the same method of analysis, it will be found that the spectral rays correspond with those of the blue part of the flame of a candle; and I have taken the greatest pains in observing their position, and their distances apart. In general these two experiments require a considerable amount of address and experience, for the feeble light of the blue part of the flames does not allow of the rays being studied in detail; but nevertheless it is not possible to make a mistake in the appreciation, the spectrum in the two parts of the flame being identical. From this experiment it would appear perfectly logical to deduce that the lower part of the flame of a candle is the protocarbonate of hydrogen; for the spectrum analysis, which is infallible, has shown that it was not the oxide of carbon. It was under this conviction that I published, in December, 1861, this opinion, and I stated the figures which indicated the deviation and the refrangibility of the luminous rays, which then amounted to 17; of which 5 were found in the red, 6 in the yellow and green, 3 in the green, 2 in the white, and 1 in the violet.

Nevertheless, some particular studies upon the carburets of hydrogen, that were made principally with reference to a discussion with M. Berthellot on the discovery of acetylene, had inspired me with doubts as to the nature of the blue parts; the following are the motives:—the spectrum of the protocarbonate of hydrogen rarefied to a high point in a tube and set on fire by an electric spark, has not the least analogy with that of the same gas burning freely in the open air. This is not all, and a singular fact occurs connected with the appearance of this—all the carbonated substances that burn in the open air have at the lower part of their flame a blue cone, which yields for all of them the same spectrum; moreover, in the lance of the flame of gas that is produced by the blow-pipe, when a mixture of whatsoever nature is burnt of hydrogen and oxygen, there is at the base a small part of a bluish green, very brilliant, and which yields with singular brilliance the spectrum already found under these circumstances. Mr. Swann had already observed it in 1856, at the base of lighting gas burning with a current of air in the interior.

It is a remarkable circumstance thus to find in the middle of a carburetted hydrogen a brilliant point produced by the passage of the oxygen, and which is not, and cannot be, an oxide of carbon, nor a carburetted hydrogen; for the spectrum analysis opposes that explanation of the phenomenon.

I was in this state of embarrassment when I received from Mr. Attfield, the director of the laboratory of the Pharmaceutical Society of London, in 1863, a treatise in four pages, which he had read before the Royal Society. In this treatise Mr. Attfield asserted that the substance that produced the blue colour of the flame was the vapour of carbon; it was the carbon in vapour that, without doubt, in this case, and in the combustion of the carburetted gases, yielded the spectrum that has been above spoken of.

On the reception of this interesting and learned communication, I confess that I did not think that Mr. Attfield's assertion was correct, inasmuch as I found in it some details that appeared to me to be mistaken, and as I saw that the spectrum drawn by him left much to be desired in the way of certainty. In this spectrum the red rays were absent; those of the green, the blue, and especially of the violet, were incomplete and inexact. In the violet, for instance, Mr. Attfield marked three bands where I had drawn eighteen; the black lines, that were several hundred in number, were not at all indicated.

I then set to work with the preconceived notion of attacking the assertion of the English authority; but so far from this, I found, from all that resulted from the experiments, that Mr. Attfield was right, and that it was, in fact, the vapour of carbon that yielded the spectrum indicated above. The spectrum which I have drawn and published a lithograph of, having been obtained by highly intense luminous reactions, it is not surprising that I should have found in it a greater number of details and lines than my predecessors. I will add that it is the peculiarities, which are very curious and quite special, that this beautiful spectrum presents that have induced me to publish the present treatise. The description of this spectrum will be found hereafter.

I will begin with stating the theory that guided me in these researches. If it be the vapour of carbon which is concerned in the production of the phenomena, we should always meet with the same spectrum when the carbon is set free by the decomposition of a compound body, into which it enters as an element, whatever be the nature of the body to which it is united. It will be enough that the carbon be always the element, and the sole element common to different combinations which can be easily decomposed by electricity—such as the sulphide of carbon, the oxide of carbon, carbonic acid, cyanogen, the numerous series of the carburets of hydrogen, acetylene, that is so rich in carbon, and even alcohol; if properly examined by electricity and the spectrum analysis, they ought all to yield the same answer to the question. Cyanogen is the compound which has given the most satisfactory answer to my researches. I will speak of it with greater detail, because I shall have occasion, in so doing, to explain a convenient and precious method which renders the preparation, preservation, and the manipulation of gases easy, which cannot be effected unless over mercury, on account of the solubility or the decomposition over water of those gases.

An air-pump can be easily converted into a gasometer and into a reservoir of gas. Take, for instance, cyanogen; it will suffice to place at the upper part of the pump, before the gauges, and after the tube of entry, two horizontal tubes of caoutchouc, one of them containing cyanide of mercury in powder, and well dried, and the other chloride of calcium in a spongy form, and fitted for the desiccation of gas (it will be necessary to close the passage of the gauge that corresponds with the sulphuric acid, because the gas is very soluble in it). Then a vacuum is made in the whole of the apparatus with the greatest care to within one-fourth of a millimètre. The vacuum is preserved thus for a space of 24 hours, in the first place, in order to withdraw the atmospheric air that is within the tubes, and to ascertain that the gauges work well; then the gas is liberated, and it arrives in a dry state in the barometric chamber; it fills this chamber, and thus yields a volume of about 2 litres of cyanogen, pure and dry, upon which the experiments may be tried. It can easily be extracted by means of the cock that gives entry to it, and by raising the reservoir; and is led by means of the tube in caoutchouc to any place where it is required to be burnt. In this way a very fine flame of cyanogen is obtained, which dilates, and rounds itself after the gas leaves the vessel, and is lighted, in a remarkable manner. It is easy to see that before the combustion of the elements of this body, nitrogen and vapour of carbon, they are highly condensed. The spectrum of this gas can then be studied, and drawn in all its magnificence.

Contrary to what Mr. Attfield has said, this spectrum is not that of nitrogen, which is so easily recognizable by the bands of equal width in the parts that are the least refractable. These bands are like fluted columns, filled in on one side by black lines, that are very fine and close together. There are, however, analogies between the two spectra; they are both of them of great length; the colours, blue and violet, are both of them considerably extended. These circumstances solve the question, it may be observed, of the spectrum that is given by the combustion of a gas composed of different elements; it is not necessarily composed of the superimposed spectra of each of the gases that enter into the composition of the gas experimented upon.

If the cyanogen is burnt by means of a blow-pipe of two currents, and the current of very pure oxygen (this is an indispensable condition) be directed to the centre of the flame of the cyanogen, one of the most beautiful effects of combustion possible will be produced; and this experiment is one of the most extraordinary that can be performed on the combustion of gases. There is produced in the centre of the rose-violet of the cyanogen a globe of a whitish-green colour, that is singularly like the electric light between two carbon points. If the spectroscope be turned towards this brilliant light, it is possible to perceive, with a marvellous degree of splendour, the same spectrum as in the blue part of the flames of the hydrocarbons. Thus it is to the carbon alone, but the carbon in the state of vapour, that this globe is due, which carbon will pass to the state of the carbonic acid by its union with oxygen. However, this spectrum is not the only one; there may be seen with it, but in a feeble manner, the special spectrum of the cyanogen, and this tends more and more to disappear in proportion as the oxygen increases more and more, and aids the combustion of the cyanogen. As to the spectra of the nitrogen, it cannot be perceived in this bright light. The brilliance of the spectrum above described, the most beautiful I have ever seen, allows the aspect of the parts that have no brilliant rays to be seen in their shaded tints, and even in those parts that are between those rays; in fact, there are there, and they can easily be seen, some hundred rays placed side by side, and resembling lines of interference; they are extremely near to one another in the part that is least refrangible, their distance goes on increasing, and in a regular manner, until the limits of the violet colour, without any intermission. We shall revert hereafter to these curious lines; we confine ourselves here to saying that having seen them in the combustion of cyanogen, we sought them in the combustion of the carbruets of hydrogen, burnt in oxygen. Placing the instrument to the point, they were found again, and I was surprised that I had not seen them on the first occasion. To see them always, and with ease, it is necessary to spread out the spectrum, and to use a spectroscope formed of two prisms, one of 50° and the other of 60°, very refringent, and of the sulphate of carbon. The prisms that I employ are of brass. I will state, in a subsequent memoir, how it is that the sulphate of carbon retains its purity, and its limpidity

without rival amongst the substances that enter into the composition of prisms.

It was not by the aid of this flame that I studied and drew the spectrum of the vapour of carbon; there is another flame that solves the question in a manner more decided and clear. The spectrum is as beautiful, and it is not accompanied by any other spectrum. This experiment does not admit of any doubt on the nature of the body that produces the light; it is the vapour of carbon.

A current of cyanogen that is continuous and rapid is made to pass through a tube of about 3 centimètres in diameter, and terminated by a narrow opening, to which an incandescent body is approached, in order to see that the cyanogen is pure hy the colour of the flame. In the centre of the tube two wires of platinum are soldered, but at the distance asunder of 10 centimètres, which are curved upwards and downwards towards each other, so that they are not further apart than about 3 or 4 centimètres. When the observer is sure that the cyanogen is pure, and without any atmospheric air, he passes through the wires the spark of a powerful Ruhmkorff's battery, the ordinary apparatus not being sufficiently powerful on account of the bad conducting power of the cyanogen; this is the gas with the worst conducting power that I am acquainted with. Very often the spark will fly off at the exterior, without forcing its way through the cyanogen.

Directly the spark has passed the cyanogen becomes decomposed; a magnificent sphere of a whitish green, exactly like that described in the last experiment, appears in the tube, with an abundant deposition of carbon, which is thrown down on every side, because it does not, as in the previous experiment, find oxygen to transform it to carbonic acid. The spectroscope turned towards this light yields the beautiful spectrum already described, but quite pure, and without any foreign substance. Evidently doubt is no longer possible; this spectrum is clearly that of the vapour of carbon that was cited.

There are, moreover, some experiments that are all of them confirmatory. If a hydrocarbon of any kind be taken—and I have selected purposely that which is the richest in carbon, acetylene, because it yields the most brilliant results—the spectrum of all these gases will be identical. The acetyline is placed in a large tube provided with electrodes in platinum, as in the last experiment; as soon as the electricity passes, the same brilliant and spherical light appears between the electrodes, and it produces the same spectrum—that of carbon. The influence of the hydrogen disappears in this brilliant light. A remarkable circumstance accompanies this experiment; the carbon, which appears with great abundance, as in the former case, rises above the electrodes, it being carried upwards by the current of warm gas, to the height of the test-tube placed vertically; there it falls again, but around the electrodes, and about the tube, it is attracted, and it gives rise to long filaments that are directed towards the electrodes, exactly like the magnetic spectrum produced by a magnet on iron filings. If, after the experiment is completed, one looks into the tube by the open end, it will be found that the carbon thus disposed resembles a black cobweb, that proceed from the sides of the tube, and turns itself towards the electrodes, which it surrounds. This arrangement has sufficient solidity to allow of the tubes being preserved in which the experiment was made, and the appearance was retained for a considerable time.

It will be easy to make the following remark with reference to the acetylene. This gas is produced, as is well known, by passing a powerful spark between two electrodes of charcoal in an atmosphere of hydrogen; and, on the contrary, there is a decomposition of acetylene when the spark passes through an atmosphere of this gas in a pure state. Those, then, are warned who may desire to obtain the acetylene by the above means. It will be necessary to introduce into the saucer an absorbent of acetylene, which should carry off and withdraw from the decomposing action of the spark as fast as it is produced.

Another experiment, easier than the preceding, and which does not require the preparation of any kind of gas, especially that of acetylene, yields analogous results. A tube similar to the last is taken, but it is closed at one end, and diminishes in dimension at the other; near this end are placed the electrodes of platinum; a portion of sulphate of carbon, which is previously boiled to drive off the air, is introduced, and this end is closed, so that the tube does not contain anything more than the liquid sulphate of carbon in the lower part and the vapour of that body in the upper; the electrodes are in that part; the electricity is made to pass through the electrodes, and immediately the same spectrum is seen, only this is detached from a light ground, which is continuous, and is formed by the vapour of the carbon. The oxide of carbon and the carbonic acid treated in the same way as acetylene present some interesting details.

Decomposed by electricity, and in the same manner as the preceding gases, the oxide of carbon yields a brilliant light, in which the spectrum of carbon appears distinctly; but if the experiment be continued carbon is deposed, and the spectrum of carbonic acid remains. It would be easy, then, to conceive, that the carbonic acid should, when exposed to the same mode of experimentation, only yield the special spectrum of the carbonic acid. Nevertheless, by keeping the eye steadfastly fixed upon the spectroscope at the moment when the induction wires are put into play, the first shock of electricity will display a spectrum which is not exactly that of carbonic acid, though only for a short time.

I must add that, excepting in the case of the cyanogen, all the experiments were made with the small apparatus of M. Ruhmkorff.

I will add a few words on the spectrum of carbon that may be seen by burning some oxygen in a blow-pipe with a double current. In the red there is a first band without luminous rays; these are continued into the orange red, where they are six in number; then comes a space without bright lines, and gradually darkening until it approaches the yellow green, where there are seven fine luminous rays, that are distinctly marked and equidistant; and the two last are distinctly terminated. They are separated by dark spaces, having the appearance of being sunk. After these rays there is a new, and a larger, space of luminous rays; but the shaded tint of these goes on increasing in darkness, with a just gradation, until the rays arrive at the brilliant green, where there are three brilliant green rays that are equidistant; then a large space, at least double the width of the obscure spaces preceding, shaded and tinted like them, in a manner to present a more obscure part on the side that is most refrangible. This continues to the blue violet; but it is particular in this respect—that it presents four bands that are less obscure than the preceding. It is in this part that the lines—which are black, fine, and equidistant—are seen in the most admirable manner, as we before said. These black lines, that are just like fine lines of interference, are very visible in the other parts of the spectrum, when one knows how to seek for them. They are marked between the five rays of blue that follow them. Then they are continued in the violet. At the third of that space there is a series of lines that are sombre, black, and very close together. The violet commences by a fine line that is sufficiently luminous; then a large and fine band of black, followed by a line that is clearer, and a band that is less luminous with fine lines. Then follow fifteen violet rays, that are more luminous, and are separated by black lines or rays.

This spectrum is easy to colour, and any one would succeed equally in colouring the spectrum of nitrogen, which I published, or rather of which I gave about 200 copies to those interested in such questions; for it consists only of five flat tints, and is naturally shaded by fine black lines. It is different with the spectrum of cyanogen, which is the most beautiful, and the richest of all, when the flame is very luminous. It is formed of a series of luminous bands, which are nearly equal, and proceed from the red to the violet. They are of a character that is rather round, like certain parts of the salts of manganese. The bands are thus disposed:—

The *red* presents	2	bands.
The decided *orange* . . .	4	„
The *yellow*	2	„
The *green*	8	„
Then a large dark space.		
The *blue* presents	7	„
The *violet*	7	„ in all, 30 bands.

I would recommend that when it is desired to examine spectra by the means of decompositions produced by electricity, that electrodes of aluminium be not used; this metal that is excellent in certain circumstances, and particularly when the poles are far apart, yields some special lines which alter the spectrum that is under examination. Platinum has not this inconvenience.

I think that a condensed accounnt of this memoir is not wanted; but I will say in terminating, that from all the facts which have been recorded in it, that the theory of flame ought to be modified, inasmuch as the blue part of it is neither the oxide of carbon nor protocarbonate of hydrogen, as the reactions of the spectrum clearly show.

When a body in combustion is approached to the wick of a candle, the wick takes light, and burns until the wax or the stearic acid melts and rises in the wick. The flame then assumes the appearance that has been described. The liquid that is melted rises in the wick, by capillarity; it decomposes by giving off the gaseous hydrocarbons, which ascend the wick; they dilate there, and disappear by the combustion; they create a vacuum in which the liquid rises continually. The hydrogen, which is the element of the hydrocarbons that is most combustible, burns the first and forms a sheath that is little luminous, but very warm, that extends from the base of the flame from the lower part, that is to say, of the blue part part of it, to the top. The blue part, being perfectly preserved from the contact with the oxygen, but near the hydrogen in combustion, is composed of carbon in the state of vapour; this gaseous body is blue, and very transparent. The interior of the blue cone, on the contrary, is continually cooled by the arrival in the wick of the liquid which there decomposes, and which requires the presence of heat to assume the gaseous form; then the vapour of carbon there assumes the solid form in giving off its latent heat; and afterwards being much subdivided, and meeting around it hydrogen in combustion, it becomes of a white heat exactly as a thread of platinum, which is black at the centre of the flame and becomes incandescent in the part where the hydrogen is burnt. Lastly, the whole of the carbon passes into the state of carbonic acid at the summit of the flame and in contact with the air. It is necessary to remark that it is to the hydrogen in combustion, and to the high temperature that it developes, that the flames of the carbon are indebted for their great light; for if the hydrogen is not in sufficient abundance, as in the case of acetylene, or that of turpentine, the flame is dull, yellow, and smoky. If a jet of hydrogen be brought round these flames, they will immediately assume a great brilliance; they are withdrawn from the action of oxygen, and the carbon passes to the gaseous form in the solid state, very finely divided and incandescent. If, on the contrary, the oxygen is brought into the interior of a jet of bicarbonate of hydrogen, then the large and fine flame loses its brilliance; it loses by becoming thinner; and, if the arrival of the oxygen be properly regulated, it becomes reduced to a single point, the fine flame disappears, and the temperature is carried to a high point.

In the experiment on cyanogen burnt with a jet of oxygen, the high temperature permits the vapour of carbon to be very warm; the high blue colour has passed to that of greenish blue, very brilliant, and its spectrum appears with great beauty in the midst of the eclipsed spectrum of cyanogen.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF JUNE, 1865:—

Maximum light estimated by sperm candles according to the Act . .	15·8
Minimum light—sperm candles	13·0
Average light—sperm candles	13·9
Traces of ammonia, indicated by turmeric test-paper . . .	Constantly.
Traces of sulphuretted hydrogen, indicated by lead test-paper. .	None.

MR. YOUNG'S PARAFFIN PROJECTS.—Should the shale-fields in West Calder yield the necessary quantity of raw material, we may have ere many years not a few changes effected by the paraffin manufactures. Oil will be produced at such a moderate rate and so superior to the quality formerly in use that the whale fisheries may suffer. Whether this result follow or not, it is quite apparent that new uses must soon be discovered for an article that can be produced in such large quantities. Mr. Young has set himself to the consideration of this problem, and intends to increase as far as possible the number of products derived from shale, and thus greatly extend the sphere of his operations. He proposes to distil coal at a low temperature, and apply the manufactured articles to new purposes. His design is to collect the gaseous portion, and sell it at a cheap rate as a heating and lighting agent. If he carry out his project, a new gas will be introduced and sold for illuminating and other purposes, at a considerably lower rate than at present. The coke, which is the residue of the oil after it passes through the stills, forms excellent smokeless fuel, and a trade in this may be largely developed. The paraffin oil, he thinks, may also come to be advantageously used for the fuel of steamships. Being liquid, it could be stored in out-of-the-way places, thereby economizing space. Its use would also save a staff of firemen and their accommodation on board ship, and the increased space thus gained could be made available for other purposes. He estimates that a steamship in crossing the Atlantic consumes 1600 tons of coal in a ten days voyage. The Admiralty allowance for a ton of coal is 48 cubic feet. A ton of paraffin oil would go as far as a ton and a half of coal, and would only occupy 36 cubic feet, as against the 72 cubic feet required for a ton and a half of coal. Nor does this idea of substituting oil for coal as the fuel of ships seem chimerical or impracticable. The Duke of Somerset recently expressed a confident hope that the time was approaching when the ships of the navy would carry petroleum as fuel in place of coal. This result realized, the development of the oil trade in Scotland would receive an impetus that would make it rank among the most important of our manufactures.—*Scotsman*

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited) .	5 0 0	5 6 0	5 5 0
10000	5	Do., second issue	3 0 0	5 0 0	3 to 3¼
10000	5	Do., third issue .	1 0 0	5 0 0	1¼ to 1⅜
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29¼ to 30
8200	20	Do., new . . . . (Norwich, Huntscoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	78¾ to 79½
6000	50	Do.	30 0 0	10 0 0	48 to 48½
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7½ to 7⅝
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L) Colonial & General	5 0 0	7 0 0	2⅛ to 3
17490	25	*Commercial* . . .	25 0 0	10 0 0	43 to 43¾
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13½ to 14
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	7 0 0
20000	10	*Great Central Gas Consumers* . . .	10 0 0	10 0 0	16½ to 16¾
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	83 to 83½
1300	100	Do., bonds . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian .	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	93 to 93¼
3000	40	*Independent* . . .	40 0 0	10 0 0	71 to 73
3000	10	Do.	10 0 0	5 0 0	8 10 0
3000	20	Do.	7 0 0	7 10 0	9 0 0
6886	50	*London*	50 0 0	10 0 0	79 to 79½
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sk		6 0 0	
11828		Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	2 10 0	
150000	1	Oriental, Calcutta	1 0 0	8 0 0	1½ to 1¾
10000	5	Ottoman (Limited)	5 0 0		4 to 4½
10000	10	Parà (Limited) . .	10 0 0	5 0 0	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	33½ to 34
3600	100	Do., new . . .	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
		Rio de Janeiro (L).			
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference .	5 0 0	7 10 0	
		Shanghai			
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	16 0 0
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35 to 35½
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16¾ to 16¾
10000	10	Do., B shares.	5 0 0	10 0 0	8⅝ to 8¾
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Share List of Water Companies.

See "Share List of Gas Companies" for Gas and Water Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
		Airdrie & Coatbrdg	£ s d	£ s d	£ s d
588	1	Alexandria, Dumb	1 0 0		0 2 6
800	25	Ayr	25 0 0	5 0 0	25 0 0
		Banbury			
		Belper			
9600	25	Birmingham . . .	25 0 0	6 10 0	34 0 0
9600	17½	Do., new shares.	3 0 0	6 10 0	
6000	10	Blackburn	10 0 0		
		Boston			
		Br. of Earn (L) £450			
		Brighton, Hove, &			
8000	25	Bristol . [Preston	25 0 0	3 2 0	20 to 21
8000	12½	Do., preference .	12 10 0	5 0 0	13 2 6
		Broadstairs. . . .		4 0 0	
		Brompton and Gillingham			
5000	10	Bury and Radcliffe	10 0 0	2 0 0	10 0 0
1333	15	Do., pref. shares.	15 0 0	10 0 0	31 15 0
1333	18	Do., do. . .	6 0 0	10 0 0	14 0 0
2000	10	Do., do. . .	5 0 0	4 0 0	5 0 0
2000	10	Do., do. . .	1 0 0	4 0 0	5 0 0
2500	10	Cambridge	10 0 0	4 10 0	
2500	3	Do.	3 0 0	4 10 0	
1500	20	Cardiff	20 0 0	7 10 0	24 to 25
1500	10	Do.	10 0 0	7 10 0	14½ to 15
	10	Carlisle	10 0 0		13 to 14
55625	Sk.	Cheltenham . . .	100 0 0	5 5 0	120 0 0
687½	25	Do., pref. shares.	25 0 0	4 10 0	25 0 0
		Chepstow			
		Chester			
2485	2	Clay Cross	2 0 0	8 0 0	2 16 0
		Colchester			
175	20	Colne, Lancashire.	20 0 0	5 0 0	28 0 0
		Consett District. .			
		Dartford			
1250	20	Darwen	20 0 0	2 10 0	19 to 19½
1400	5	Deal	5 0 0	7 0 0	6 0 0
1511	25	Derby	25 0 0	9 0 0	53 0 0
400	50	Dudley	50 0 0	1 0 0	20 0 0
250	25	Do., pref. shares	25 0 0	4 10 0	
		Dukinfield			
11600	10	Dundee	10 0 0	5 0 0	11 0 0
2670	5	Dunfermline . . .	5 0 0	2 0 0	2 10 0
	5	Durham	5 0 0		
7360	25	Edinburgh	25 0 0	5 0 0	28 0 0
7360	12½	Do., new shares.	12 10 0	5 10 0	16 0 0
7218	6¼	Do., do. ¼ shares	6 5 0	5 0 0	7 0 0
5581	6¼	Do., do. do.	2 10 0	5 0 0	2 15 0
2000	25	Exeter	25 0 0	6 10 0	42 0 0
		Falmouth	£ s d	£ s d	£ s d
		Folkestone			
		Gosport			
	20	Gravesend & Milton	20 0 0	3 0 0	14 to 16
		Great Grimsby (L)			
1000	5	Greenock (Shaw's Gravitation) .	50 0 0	7 0 0	66 to 70
		Guiseley, n. Leeds.			
		Harrogate			
		Heywood.			
1500	10	Kilmarnock . . .	10 0 0	2 0 0	8 0 0
3200	25	Leicester	25 0 0	4 10 0	27 10 0
120	25	Lewes	25 0 0	6 0 0	26 0 0
		Limerick			
1080	25	Lincoln	25 0 0	7 0 0	38 0 0
360	25	Do., new shares.	25 0 0	4 5 0	38 0 0
		London Comps.—			
47000	10	Berlin	10 0 0	4 10 0	11¼ to 11⅝
12000	25	Chelsea	25 0 0	5 5 0	27 10 0
975000	Sk.	East London . . .	Stock.	6 0 0	125 to 127
10000	50	Grand Junction .	50 0 0	8 0 0	80 to 82
5840	25	Do., ½ shares.	25 0 0	8 0 0	40 to 41
2160	25	Do., new ½ sh.	10 0 0	7 10 0	
2310	100	Kent.	100 0 0	6 0 0	130 to 132
1460	100	Lambeth	100 0 0	6 0 0	113 10 0
4120	50	Do., new shares.	50 0 0	6 0 0	51¼ to 53
		New River		141 6 8	£17,400
1560	100	New River London Bge. Annuities	100 0 0	per sh. 2 10 0	55 0 0
3036	100	Southwark & Vxll.	100 0 0	6 0 0	125 to 127
3036	25	Do., do.	25 0 0	6 0 0	31½ to 33½
1296	100	Do., do.	70 0 0	5 0 0	74 to 76
1296	100	Do. (1867) . .	30 0 0	4 10 0	42 to 44
12168	61	West Middlesex .	61 0 0	5 15 0	116 0 0
		Do., new shares.	6 2 0	per sh. 4 0 0	9 to 9¼
		Liskeard			
		Maidstone			
		Maldon (Lim.) . .			
		Margate			
		Matlock			
550	10	Neath	9 0 0	4 10 0	10 10 0
250000	Sk.	Newcastle-on-Tyne (Whittle Dean)	Stock.	5 0 0	93 0 0
9600	6¼	Do., do.	5 0 0	5 0 0	4½ to 4⅝
135	20	Newport, Carisbke.	20 0 0	4 10 0	26 0 0
		Newport, Mon. . .			
		Newry (L.) £6000.	£ s d	£ s d	£ s d
2000	10	North Cheshire . .	10 0 0	7 10 0	13 0 0
1581	10	Do.	2 0 0	7 10 0	2 12 0
	10	North Shields . .	10 0 0		10 to 10¼
		Norwich			
3600	50	Nottingham . . .	50 0 0	5 0 0	60 10 0
		Pontypridd (Lim.)			
		Poole District (L.).			
8000	10	Portsmouth . . .	10 0 0	6 0 0	
8000	5	Do.	2 10 0	6 0 0	
301	10	Queenstown (L.) .	10 0 0	4 0 0	10 0 0
99	10	Do.	2 0 0	4 0 0	2 0 0
100	10	Do., new shares.			
400	5	Ramsey, I. of Man	5 0 0		
1500	10	Ramsgate	10 0 0	6 0 0	13 to 13½
		Reading			
		Richmond, Surrey			
		Rochdale			
		Rothesay (L.) £7600			
		Royston (L.) £2500			
		Saffron Walden (L.)			
		St. Helen's . . .			
		Scarborough . . .			
		Sheffield			
		Shrewsbury . . .			
		Southport			
11184	10	South Staffordsh.	10 0 0		11 17 0
2354	10	Do.	5 0 0		
		Spalding			
21000	5	Staffordshire Potts	5 0 0	6 0 0	7 5 0
		Stockport. . [boro'			
1800	12½	Stockn. & Middles-	12 10 0	6 0 0	
800	12½	Do., A shares.	12 10 0	6 0 0	
1591	12½	Do., B shares.	7 0 0	6 0 0	
4000	10	Do., C preference	2 0 0	5 0 0	2⅞ to 3
26700	5	Sndrland & S. Shlds.	5 0 0	8 0 0	8 17 6
		Tolcross, Lanark .			
		Tunbridge Wells .			
		Tweedmth (L) £500			
		Wakefield			
		Warrington . . .			
		Wellington, Salop.			
		Weston-sup-Mare.			
		Weymouth			
		Winchester G. & W.			
		Wirral, Cheshire .			
20000	5	Wolverhmptn New Yeadon (Limited).	5 0 0	4 0 0	5 0 0
6000	10	York New Co. . .	10 0 0	5 0 0	11 12 6

The Water-Works in the undermentioned towns belong to private individuals:—

Campbelltown. Chidwall (Lancaster). Hyde (Cheshire). Knaresborough. St. Leonard's. Stamford.

The Water-Works belong to Local Boards of Health, Municipal Corporations, or Commissioners acting under Special Acts of Parliament, in the following towns:—

Aberdeen. Abergavenny. Aberystwith. Alnwick. Ashby-de-la-Zouch. Ashton-under-Lyne. Baildon, Yorkshire. Barnsley. Bath. Belfast. Bilston. Birkenhead. Bishop's Auckland. Bolton.
Bradford, Yorkshire. Brynmaur, Brecon. Burnley. Bury St. Edmund's. Carmarthen. Chelmsford. Chorley. Cork. Coventry. Croydon. Darlington. Dartmouth. Dorchester. Dover.
Dublin. Dumfries. East Stonehouse. Ely. Epsom, Surrey. Fareham, Hants. Glasgow. Gloucester. Greenock. Halifax. Hastings. Haverfordwest. Haworth, Yorkshire. Huddersfield.
Hull. Ilfracombe, Devon. Keighley. King's Lynn. Kirkcaldy. Knighton, Radnor. Lancaster. Leamington. Leeds. Leek. Leith. Liverpool. Llandilo. Llanelly.
Lytham. Macclesfield. Maidstone. Manchester. Merthyr Tydvil. Montrose. Nantwich, Cheshire. Oldham. Oxford. Paisley. Pembroke. Penrith. Penzance. Perth.
Peterhead. Pontefract. Poole. Port Glasgow. Preston. [ness. Pultneytown, Caithness. Rotherham. Rugby. Salford. Salisbury. Sheerness. Shipley. Southampton. Stirling.
Stroud. Swansea. Teignmouth. Tormoham. Warwick. Welchpool. West Cowes. Whitby. Whitehaven. Wigan. Windhill, Yorkshire. Wirksworth. Worcester.

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.			Glasgow.			Newcastle			Wales.			Yorkshire, Derbyshire, and Staffordshire.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Pig Iron, No. 1, G.M.B.	3	17	6	2	15	3	2	12	6	3	5	0	3	10	0
1½ and 2-inch Socket-pipes	7	10	0	6	0	0	6	15	0	6	15	0	7	10	0
2½ and 3-inch ditto	7	0	0	6	0	0	6	5	0	6	10	0	7	0	0
4 and 5-inch ditto	6	10	0	5	10	0	5	15	0	6	0	0	6	10	0
6 inches and upwards ditto	6	5	0	5	0	0	5	10	0	5	15	0	6	5	0
Retorts, 1st fusion, hot blast	6	0	0		—		5	5	0	5	10	0	6	0	0
Ditto, 2nd ditto, cold ditto	7	0	0	5	15	0	5	15	0	6	0	0	7	0	0
Tank-plates, ¼ thick and above	6	10	0	5	10	0	5	10	0	5	15	0	6	5	0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.		1¼ in.		1½ in.		1 in.		¾ in.		½ in.	
Patent Welded Tubes, from 2 to 12 feet— per foot	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
	1		1	0	0	10	0	7	0	5	0	4½
Ditto ditto, from 6 inches to 18 inches— each	3	0	2	0	1	9	1	3	1	0	0	9
Connecting-pieces, or Long Screws	3	6	2	3	2	0	1	6	1	2	0	11
Bends, Springs, and Elbows (wrought iron)	3	9	2	3	1	9	1	0	0	10	0	8
Tees, wrought or cast	4	0	2	6	2	0	1	6	1	1	0	10
Crosses, ditto	4	6	3	0	2	6	2	0	1	6	1	2
Iron Cocks	17	6	9	6	7	6	4	6	3	3	2	6
Ditto, with brass plug	28	0	16	0	13	0	7	0	5	6	4	6
Diminishing Sockets, Caps, Plugs, and Nipples	1	3	0	9	0	8	0	6	0	5	0	4
Plain Sockets	1	0	0	8	0	7	0	5	0	4	0	3
Syphons, 2-quart	15	0	14	0	13	6	13	0	12	0	—	

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s.6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Pearetb, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Pearetb, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	5s.9d
Cork	9s. 6d. to 9 6
Dover, Folkestone, and Ramsgate	6 3
Dublin	9s. 6d. to 10 0
Exeter Quay	8 6
Ipswich	5 6
London (from Leith)	8 6
London (Pool)	6 0
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7s. to 7 3
Plymouth	7 9
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel:—

Barcelona	£24 10s. to £25 10s
Bordeaux	15 0
Boulogne and Calais	£7 to 7 10
Cadiz	17 0
Copenhagen	£9 to 9 5
Genoa	£22. 15s. to 23 0
Hamburg	£8 to 8 5
Havre de Grace	£9 to 9 5
Leghorn	23 0
Lisbon	16 0
Rotterdam	7 10
Stettin	10 12
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 6
Ingham's ditto (at Wortley), p. 1000..	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	86 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (in London), p. ton ..	7 15 0
Foreign Spelter, p. ton	22 5 0
English Block Tin, p. ton	94 0 0
Banca, p. ton	94 0 0
Tarred Rope Yarn, p. cwt.	1

Advertisements.

GEORGE GLOVER & CO.'S

IMPROVED DRY GAS-METERS,

STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

" George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	,,	,,	,,	2·812.
Croll, Rait, and Co.	,,	,,	,,	5·540.
Thomas Fletcher	,,	,,	,,	15·121.
Joseph Boulton	,,	,,	,,	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

1862.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

CLASS II.

This Paint having been in general use over four years (especially in some of the principal Gas-Works) and proved itself the best light-coloured paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (28s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, **COVERING SO MUCH MORE WORK**, costs under 20s. per cwt., as compared with White Lead at 28s. per cwt.

CONTENTS.

	PAGE
Notes upon Passing Events:—	
The Cattle Disease	597
The Atlantic Telegraph	597
Widening of Park Lane	597
The Thames Embankment	598
The Water-Works Bill	598
Ill-Treatment of the Metropolitan Poor	598
Leading Article:—	
Gas Legislation of 1865	599
Circular to Gas Companies:—	
The Gas Acts of 1865	602
Threatened Attack upon Gas Companies	603
The Metropolitan Gas Accounts for 1864	603
Correspondence:—	
Improved Photometric Apparatus	603
Method of Scurfing Clay Retorts	603
Register of New Patents:—	
Newton, W. E.—Pumps	604
Hill, A.—Privies, Dry Closets, and Commodes	604
Applications for Letters Patent	604
Grants of Provisional Protection	605
Invention Protected for Six Months	605
Notices to Proceed	605
Patents which have become Void	605
Legal Intelligence:—	
Staffordshire Summer Assizes—	
The Burton Improvement Commissioners and the late Manager of their Gas-Works—Dyer *v.* Best	605
Hampton *v.* the Cradley Heath Gas Company	606
Miscellaneous News:—	
Meeting of the City Gas Company	607
Meeting of the Gas Products Utilizing Company	608
Meeting of the London Gas-Meter Company	609
Meeting of the Commercial Gas Company of Ireland	610
Metropolitan Board of Works—	
The Use of Subways	611
The Nuisances at Barking and Crossness Outfall Sewers	611
Netherlands-India Gas Company	611
Share List of Metropolitan Gas Companies	612
Price Current	612

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, August 22, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, AUGUST 8, 1865.

Notes upon Passing Events.

A NEW and terrible disease has lately broken out amongst our horned beast, which sweeps away the whole of a dairyman's stock, without giving a chance to medical treatment. Out of 150 cows attacked at one yard in Islington, all but three died, and those are useless. We say new because our veterinary surgeons say that they are unable to trace its symptoms to any known disorder. At present, breeders, feeders, dairymen, and carcase butchers, are alike under the influence of a complete panic. The sanitary doctors, with Professor Gamgee at their head, are making the most of the situation, and if they can get their way, will place a sanitary inspector paid by Government, in every dairy, every cattle-bringing train, and every butcher's shop. The effects of the disease are sufficiently alarming and disastrous, without the help of medical exaggeration. The man in whose herd or dairy the disease breaks out, after the beasts affected have been in contact with his other horned stock, may consider them as all lost, and worth no more than carrion. There is one course by which owners of stock can protect themselves—that is, to make all strange cattle pass through a sort of quarantine before being allowed to associate with sound cattle. Without the assistance of stock-owners, all attempts at Government inspection will fail. But according to the best evidence, the disease is home growth, and not of foreign origin. Up to the present time there is no evidence that public health has suffered from the consumption of meat. The most poisonous meat is that which has become tainted. Strict supervision of markets and shops may do something—in London, the New Dead Meat Market will do a great deal—towards securing the sale of sound meat; but, after all, the chief security for public health must rest with the consumers of meat. As for Professor Gamgee, he is a man of more than ordinary accomplishments, with an education, in a literary point of view, far above the common run of veterinary surgeons; but his powers of imagination seem to excel his powers of observation. The miserable figure he cut as a witness before the House of Commons Committee on the Cattle Disease Prevention Bill, the rash assertions he there made, and the ill-supported opinions he there promulgated, destroyed his position as a scientific witness. He now seems to have taken a wiser course, and endeavoured to create a public opinion amongst stock-owners. Last year an appointment under Government as inspector-general of all markets and cattle fairs seemed continually dangling before his eyes. While there is no question about the poisonous character of putrid meat, there is not the slightest evidence that lung disease in its first stage, or what is called the mouth and foot disease, in the slightest degree affects the quality of meat. Due precautions must be taken, but the reports of this new cattle disease must not hurry us into the absurdities of a panic. It should be remembered that, although the present cattle disease or murrain is termed new, there never has been a term of ten years in the history of this country without the occurrence of some sort of plague amongst herds or flocks, or both. Now, of course, the daily intercourse with the Continent brings new chances of contamination. If it were not for cattle disease, there would be no trade better than that of a dairyman, who, with cattle food at a fair average price, has for sale milk and butter, for which the demand is only limited by distance. On paper there is no farming like dairy farming, and no trade like that of the London milkman. But then disease steps in and sweeps all the cowkeepers capital in a few weeks. Fortunately Parliament is not sitting to legislate in a fright. Before it meets, we shall know something certain about this new cattle murrain. At present we only know that it is fatal to the value, if not the life, of every dairy cow it attacks—that it is highly infectious—and that the cowkeepers of the metropolis are fully alive to the necessity of prompt and vigorous action.

The Atlantic Telegraph has met with its first, and it is to be feared its fatal accident. Our readers know that we have never been sanguine of the success of this great and praiseworthy undertaking. It was, at best, a lottery, with very large odds against winners. But this failure must not and will not dishearten those who have at heart a telegraphic communication between the Old and New Continents. It will only drive back speculation to the legitimate field of the shortest possible sea routes, in shallow waters, where repairs can be made with certainty whenever the inevitable breaks, which occur to all cables, take place. Mr. F. C. Webb, late resident engineer of the Persian Gulf Telegraph, at Kurrachee, was one of the first to draw attention to the necessity of seeking short lengths and shallow waters for ocean cables. His advice was little heeded, and his African Telegraphic scheme spoiled in the Government offices; but now, on the failure of the combined plans of *all the talents*, we trust that he will speak again, and call attention to the *principles* on which ocean telegraphs should be laid.

The Park Lane communication is once more before the Metropolitan Board, and this time it is to be hoped that they will grapple with it in earnest, and lay before the public the absolutely best scheme, without regard to cost. Every year the population on both sides the Hyde Park increases, and consequently every year the interchange of traffic for passengers and goods grows with the multiplication of houses. A very few years ago that part of London popularly called Tyburnia was fields and gardens, and now through the Notting-hill Station of the Metropolitan Railway alone four thousand persons pass daily. The railway extensions in progress will not diminish the traffic through Park Lane, unless a line be run directly under it from Paddington Station to Piccadilly,

and that is not likely. The Hamilton Place project for tapping the great stream with two little brooks had only one merit apparent—cheapness; that merit disappeared in committee. Gloucester House has hitherto been a formidable barrier to opening out Park Lane into Piccadilly. The Duke of Cambridge would no doubt be glad to get rid of a house much too big for him, and for that reason would be a very expensive opponent to settle with. The Board are said to be now looking at the other side of the street, where not only are the houses of an inferior quality, but those which are shops would positively gain by a wider thoroughfare. There is no absolute reason why the exit should be straight. It might bear away from Holderness House in an entirely new street through the back slums and mews toward the east into Piccadilly. At the same time, the architect and surveyor of the Metropolitan Board should not overlook the series of *cul-de-sacs* in May Fair. The wiser course would be to prepare and publish, through the illustrated newspapers, a report and plan of the proposed street improvements. This would educate public opinion, and, if circulated amongst the vestries interested, render ratepayers less impatient of the necessary taxation. But we cannot have street improvements on a great scale until Parliament reverses its past policy, and permits private companies to acquire more land than is needed for special street reforms, in order that they may make a sure profit while embellishing the City. At the risk of tiresome repetition, we must repeat that nothing less enterprising than private companies will ever make Cockspur Street worthy of its magnificent position, and clear away the mean edifices between Spring Gardens and the Admiralty. As for the state of the houses in the Strand, it is a national disgrace.

The works on the Thames Embankment are going on bravely under a wholesome rivalry between the different contractors. Already we can form some idea of the capabilities of the huge slice of land about to be reclaimed from the river. The Royal Society for the Prevention of Cruelty to Animals—a society established for the purpose of repressing a serious social evil—have been busy about the brutalities to which the horses drawing loads on the embankment have been subjected from carters and labourers. These are offences easily seen and easily repressed by fine and imprisonment. They are plain to spectators totally ignorant of horseflesh. But there is another unpunished cruelty which our great contractors, builders, and large employers of draft-horses ought to have put down long ago. It is astonishing they have not interfered, as the practice in question seriously affects their pockets. We refer to the system of impeding the action of draft-horses by a tight bearing-rein, which keeps the horse's head so high that when he draws a heavy load he must draw partly by his mouth. This is no imaginary evil, hatched by an ignorant philanthropist. Any horseman who will take the trouble to examine the cart-horses of some of the greatest firms in London will find their mouths actually enlarged by the pull of the snaffle-bit. The practice is not universal, for some sensible carters unbuckle the bit of old horses when drawing heavy weights, but it is sufficiently common to deserve the attention of the Humane Society.

The committee on the Bill for Regulating Water-Works—a Bill introduced in consequence of the terrible catastrophe at Sheffield—have made a special report, in which they lay down the following propositions:—

1. That in all cases in which it is proposed to construct a large reservoir, the undertakers shall submit to the Home Office, or the Board of Trade, as may hereafter be determined, plans and sections of the site selected for such reservoir, and of the works to be erected, and also descriptions of the mode of construction.

2. That in all such cases it should be the duty of the Home Office or Board of Trade to send a competent person to such site, in order to verify and report upon such plans, and sections, and description.

3. That it shall be the duty of the Home Office or the Board of Trade to send some competent person to inspect and report upon the works that are being constructed, so that if there be any glaring deviation from the rules laid down, either by any private Act under which the reservoir inspected may be constructed, or by any general Act respecting water-works that may be passed, the deviation may be made known to the Home Office or the Board of Trade. And it seems important, in order that competent inspectors should be employed by the Government, that they should receive ample remuneration for their labour and services.

4. That it should be the duty of the Home Office or the Board of Trade to submit such plans, sections, and descriptions, together with the observations of the person so sent, to any Select Committee appointed by either House of Parliament to consider any Bill by which powers are to be given to construct the contemplated works.

5. That when any reservoir which has been inspected as above is completed, the undertakers shall be bound to give due notice of such completion to the Home Office or the Board of Trade, and that such reservoir shall not be filled with water until after the expiration of a specified time; and that during such time it shall be competent to the Home Office or the Board of Trade to prohibit the undertakers from allowing water to be let into such reservoir. But if within the specified time no such prohibition be issued, then it may be competent to the undertakers to fill the reservoir with water.

It will be seen that Government *inspection* is the main feature of these propositions, and if the fact of being in Government employment gave wisdom, skill, and experience, much good might be expected from turning the report of the committee into law. But a very competent engineer, Mr. Bateman, observes in his evidence before this committee—"I do not think "a man would be competent who had not great previous ex- "perience, and if he had great experience the probability is "that his professional position would be such that he would "require a high salary." It is well known that Government cannot pay salaries that would be considered high by a leading engineer, and that consequently its official advisers are generally of a very inferior class. Mr. Robert Rawlinson is a favourable specimen of the official engineer, yet he is only a pigmy beside our leading engineers in the opinion of every one except himself. Before the Water Bill Committee he appeared with his accustomed air of official superiority, and gave in a list of fourteen axioms to be observed in the construction of reservoirs. These Mr. Bateman, who really is an eminent hydraulic engineer, has criticized, paragraph by paragraph, in a paper which the committee have had the cruelty to print on a page facing that containing Mr. Rawlinson's axioms, seven of which he terms, giving his reasons, "useless," "impossible," "undesirable," "absurd," "dangerous." The balance of engineering evidence is in favour of compelling the undertakers of a reservoir to submit their plans and sections to some official authority. This will ensure publicity and fix responsibility. Inspection during progress of works is undesirable, because it might diminish the responsibility of the acting engineer, while the inspecting engineer would have no real power. Engineer witnesses are also in favour of an inspection before a reservoir is filled, probably because the ceremony would tend to make more public the responsibility of the constructing engineer. Looking at the ruin that must fall on any person or company whose reservoir bursts, it may be assumed that after late experience the best security of the public lies in the self-interest of the investors in reservoirs. False economy led the managers of the South-Eastern Railway to leave the superintendence of relaying rails to a working man at a pound a week; but the Staplehurst accident and its cost will protect the managers of other railways from the pressure of cheese-paring directors requiring any such dangerous economies.

It is a great pity that when such a case as that of Richard Gibson arises in a workhouse, there is not some way of laying an extra rate for a year on the parish in which it occurs. It is by cutting down the expenses of a workhouse that the officials find favour in the eyes of vestrymen. They always prefer the doctors who order physic instead of wine! The *Lancet* has been doing a useful work by sending a special medical reporter (commissioner is the modern term) to inspect all the infirmaries of the metropolis. It is said that he has been received very cordially at most of the houses he has visited. We do not doubt it. The masters and the medical men in workhouses would for the most part prefer making the sick, aged, and infirm as comfortable as possible; but the active vestrymen—generally tradesmen who have made their money by small savings, and who have while poor denied themselves all luxuries, even the luxury of being sick—cannot sympathize with sick paupers. In fact, there is no such criminal in the eyes of a wealthy, frugal, industrious tradesman as a sick pauper. They are not bad men these vestrymen, but they are hard men, and they would not have succeeded in retail trades if they had not been hard. But there is one thing they fear more than even rates, and that is printed criticism. We are not surprised to hear that the infirmary of Islington is well managed. Intelligent doctors are an authority in Islington. That once suburban parish also boasts two rival penny papers, and has close at hand, in Clerkenwell, a powerful halfpenny organ. The more closely the subject of pauperism is investigated, the more plain it becomes that a large number of idle, thriftless, able-bodied paupers are created in towns by the extraordinary facilities which England affords for getting alms and assistance. Take from the labouring classes those who are sick or afflicted with chronic disorders—those who are prematurely worn out from careless living—there still remains a large number who prey upon poor-rates and on private charity, because they hate regular work. The demand for labour is so great in every

branch of trade that no able-bodied man need be out of work. There is every reason why parish infirmaries should be as well managed and as liberally conducted as our best hospitals, and why workhouse children should receive the most useful education that can be given to the children of labourers. It would, however, be well to establish one or more convalescent hospitals in the suburbs of great towns, where persons discharged from hospitals or infirmaries might be sent, if destitute, or resort, on paying a small weekly sum, to recover their strength and fit them for labour. Some of the most melancholy cases of distress are amongst skilled workmen and domestic servants, who, after an accident or an attack of acute disease, need on discharge from an hospital a few weeks of country air, and nourishing food to save them from falling into chronic disease and permanent pauperism. On the other hand, there are large classes earning wages of from £1 to £3 a week, who are destitute if they are out of work for one week. Will education, and Post Office savings banks, and such like institutions touch these men, or must there be some compulsory provident tax — an income-tax for the benefit of the payer? An attractive theory, but probably impossible of execution! As for the pauperism of certain agricultural districts, there is only one remedy, and that the labourers are learning themselves—emigration or migration. Labourers will not long be content with 1s. 6d. in the West, when they can get 2s. 6d. by travelling to the East of England.

GAS LEGISLATION OF 1865.

In no preceding session of Parliament has so many Acts relating to gas lighting received the Royal Assent as in that of 1865. The number of Bills that were deposited at the Private Bill Office amounted to 48, of which 15 were for giving statutory powers to companies established without the authority of Parliament, 19 for extending the powers of preceding Acts, 6 for giving additional powers relating to the supply of gas to local authorities, and 8 Bills for the establishment of competing companies. Of the last-named group of Bills not one obtained the sanction of Parliament, and of the other 6 Bills were either rejected or withdrawn. In the following notice of the principal points of interest in the Acts that were passed, we have mentioned the alterations made in each Bill during its progress through Parliament, which serve to show the tendency of the opinion of the Legislature on the claims of gas companies.

The first group of Acts noticed comprises those for the incorporation of companies that have been carrying on their operations without parliamentary sanction, taken in alphabetical order.

The Birstal Gaslight Company were registered under the Joint-Stock Companies Act in 1856. The present share capital is £4000, and they have borrowed on promissory notes £2300. The Act empowers the company to raise £40,000 additional capital by the issue of ordinary or preference shares, and to borrow one-fourth the amount of their capital. The prescribed rate of dividend on the original capital of the company is fixed at 10 per cent., and the dividend on the new ordinary shares is limited to 7 per cent., and on the preference shares to 6 per cent. The amount of any premiums arising from the sale of shares is to be considered profits. The quantity of land authorized to be purchased is 5 acres. The maximum price for 14 sperm candle gas "is to be 4s. 6d. per 1000 feet, "and the gas is to be so far pure from sulphuretted hydrogen "as not to discolour moistened test-paper embued with acetate "or carbonate of lead, when this test-paper is exposed for one "minute to a current of gas issuing under a pressure of five-"tenths of an inch of water." In the Bill as lodged by the company the dividend on the preference shares was extended to 10 per cent., and the nominal value of the new shares was to be £5, instead of £10, as in the Act.

The Act of the Bromley Gas Consumers Company contains more than double the number of clauses in the original Bill, which was remarkable for its omissions, even the amount of capital not being specified in the clauses. The company were formed in 1854, and their present capital is £50,000, which they are empowered to raise to £70,000. The dividends on the new capital are limited to 7 per cent. on the ordinary, and to 6 per cent. on the preference shares. The maximum price of 14-candle gas is fixed at 4s. 6d. per 1000 feet. No purity test is prescribed. The Gas-Works Clauses Act and the Companies Clauses Act are incorporated in the Act, though not mentioned in the Bill; and a clause is also added exempting the company's district from the provisions of the Metropolis Gas Act.

The Crays Gaslight and Coke Company, Limited, were formed in 1863. The present capital of the company amounts to £5000, and they have borrowed on mortgage £2000. The Act fixes the capital at £20,000, with corresponding borrowing powers. The maximum price of gas for the two years after the passing of the Act is to be 7s. per 1000 feet, and it is then to be reduced to 6s. The illuminating power is to be 14 sperm candles. In this, as in the preceding Act, the number of clauses is double those of the original Bill, which omitted any reference to additional capital, and fixed the maximum price of gas permanently at 7s. per 1000 feet.

The Drighlington and Gildersome Gas Company were formed in 1854, with a capital of £15,000. The Act empowers them to raise the additional capital of £35,000, by ordinary or preference shares; the preference shares being limited to 6 per cent., and the ordinary shares to 7 per cent. In the Bill, 6s. per 1000 feet was named as the maximum price of 14-candle gas; but in the Act—after mentioning the special conditions of the company, in consequence of the locality in which the pipes of the company are laid, such as the largeness of the area compared with the number of buildings supplied with gas, and the constant subsidence of the soil occasioned by the working of coal mines, and the consequent breaking of the pipes—the maximum price is fixed at 5s. 10d., with a discount when the price charged exceeds 5s. 5d. per 1000 feet. The same purity test is prescribed as in the Birstal Gas Act.

The Exmouth Gas, Coke, and Water Company, Limited, were formed in 1842, with a capital of £3600, which the Act empowers them to increase by the issue of new shares to the amount of £3000, on which the prescribed dividend is limited to 7 per cent. The maximum price of 14 sperm candle gas is fixed at 6s. per 1000 feet. No test of purity is prescribed, and the illuminating power of 14 candles is qualified by the terms, "unless prevented by frost or unavoidable cause or "accident, or during necessary repairs." No alteration has been made in the Bill as it was lodged.

The Fareham Gas and Coke Company, formed by a deed of settlement in 1835, commenced with a capital of £2500, which has been augmented to £5955, and they are empowered by the Act to increase it by the issue of new shares to the amount of £10,000. The new shares are to be sold by auction, and any premiums that may arise are to be considered as profits of the company. The dividends of the company are limited to 8 per cent. on all capital but the preference shares, which are limited to 5½ per cent. The illuminating power of the gas is to be 14 candles, and the maximum price 5s. 3d. per 1000 feet. The public lamps are to be supplied at a price not exceeding the charge to the largest consumer, and the Local Board may require that the supply shall be by meter, a meter being fixed to every fifth lamp, at their cost. The Sale of Gas Act is to be in force within the limits of the company's Act, as if it had been adopted by the justices of the division of Fareham. Power is given to the company to cut off the gas from any consumer who does anything in contravention of the provisions of the Act. In the original Bill, the total capital named was £15,000; the prescribed dividend on the original capital was limited to 10, and on the new capital to 7½ per cent., and the maximum price named for gas was 6s. per 1000 feet. There were no provisions respecting the supply of gas to public lamps.

The Act of the Folkestone Gas and Coke Company, Limited, established in 1842, empowers them to remove the site of their works to a less attractive part of the town, and to increase their present capital of £12,000 by the issue of additional shares to the amount of £24,000. As in the case of the Fareham Company, provisions have been added to the original Bill respecting the public lighting. It is provided that the gas supplied to the public lamps shall be consumed by meter or otherwise, at the option of the corporation; and if by meter, the meters are to be provided by the corporation and fixed by the company, but not more than one meter to every twelfth lamp is to be required, except at the cost of the company, who are to provide all the lamps with proper self-acting pressure-regulators. The gas supplied to any public lamp is to be "permitted to pass unrestricted to and from "such self-acting regulator," for the whole period during which the lamp is lighted. The maximum price of 14-candle gas is to be 5s. per 1000 feet, and its purity is to be tested in the

same manner as is provided by the Birstal Gas Act. Power is given to the company to enter into contract with the Government for the lighting of Shorncliffe Camps with gas, which provision was added to the Bill. The maximum price named in the Bill was 6s. per 1000 feet.

The Act of the Gomersal Gaslight Company, Limited, incorporates a company formed in 1847, with a share capital of £3875. The company have also borrowed £2600, partly on the personal security of the directors, and they have expended on the works out of profits £2720. By the Act the original capital is classed as "A" shares, on which 10 per cent. dividend may be paid; the amount of profits is capitalized as "B" shares, of the nominal value of £3 each, which is to be entitled to 5 per cent. only; and the company are empowered to raise a further sum of £7500 in "C" shares, the dividends on which are limited to 7 per cent. The maximum price is to be 6s. per 1000 feet for 14-candle gas, tested for purity in the ordinary manner. The shares of the additional capital are to be sold by auction, and the premiums are not to be considered profits entitled to dividend. According to the Bill, the holders of the "B" shares were to be entitled to dividends at the rate of 6 per cent., and the "C" shares to 8 per cent.

The preamble of the Act of the Gosport Gas Company states that in 1835 they entered into an association "for the purpose of supplying the town of Gosport and its neighbourhood "with inflammable air or gas." The present capital of the company is £21,356. 5s., and they are empowered to create additional shares to the amount of £28,625, the prescribed rate of dividend on which is to be 7 per cent., the original shares being entitled to receive 10 per cent. The maximum price for gas is to be 4s. 6d. per 1000 feet, and its illluminating power 14 sperm candles; but there is no provision respecting the purity of the gas. The pipes through Government works are to be laid subject to the approval of the Secretary for War and the Admiralty; and in case of alterations in the fortifications that may affect the pipes of the company, they are to relay them to the satisfaction of those authorities. It is provided that the gas supplied to the public lamps shall be consumed by meter, at the option of the local authorities, the price not to exceed the lowest price charged to any private consumer; but there is no provision as to average meter indication. The rate of the prescribed dividend on the additional shares named in the Bill was 8 per cent., the maximum price 5s. per 1000 feet, and the illuminating power 12 candles. There was no allusion in the Bill to the supply of the public lamps.

The Littleborough Gas Act incorporates a newly-formed company, the capital of which is fixed at £30,000, in £10 shares, whereof 1013 have been subscribed. The Act authorizes the company to purchase the existing gas-works belonging to Messrs. Newall, according to the terms agreed on, and also to purchase certain mains and pipes laid down by Mr. John Veevers. The illuminating power of the gas is to be 15 candles, and the maximum price 5s. per 1000 feet. There is no mention of purity. In the Bill the illuminating power was fixed at 14 candles, and the maximum price at 6s.

The Act for incorporating the Rastrick Gas Company, Limited, formed in 1864, limits the capital of the company to £25,000, in £10 shares. The Act provides that at the cost of the Local Board the company shall provide and lay all necessary service-pipes for lighting the public streets, and supply gas at the lowest price charged to any private consumer; the lamp-posts and other apparatus being also provided at the cost of the Local Board. The maximum price of 14-candle gas is to be 5s. per 1000 feet. The Bill in its original state had a long preamble relating to the supply of gas to the Manchester and Leeds Railway Company, at Brighouse station, by certain commissioners, but that part of the preamble and the clauses referring to it have been omitted in the Act. The clause relating to public lighting has been added to the Bill; and the illuminating power has been raised from 12 to 14 candles,

The Redhill Gas Act incorporates a company established in 1860, for supplying gas to Warwick Town and Redhill, with a capital of £5000. The capital of the incorporated company is to be £50,000; the illuminating power of the gas 14 candles, and the maximum price 5s. 6d. per 1000 feet. There is no provision respecting the purity of the gas. The amount of capital named in the Bill was £100,000. The maximum price was 6s. per 1000 feet, and the illuminating power 12 candles. The Bill also contained several clauses relating to the supply of water, which are omitted in the Act.

The preamble of the Winchester Water and Gas Act recites the formation of two separate companies for the supply of gas and water to the City of Winchester, the granting of leases of the two companies to Mr. Stark, and the desire of the two companies to be dissolved and amalgamated into one company, with the consent of that gentleman. The capital of the amalgamated company is to be £61,500, of which £36,500 is the original capital. The additional shares may have preference attached, but there is no distinction in the amount of prescribed dividends. The illuminating power of the gas is to be 14 candles, and the maximum price 5s. per 1000 feet. The public lamps are to be supplied on the lowest terms charged to any private consumer, to any lamp situated within 25 yards of a main. In the Bill the illuminating power was fixed at 12 candles, and the maximum price for gas supplied beyond the borough was 5s. 6d., but in the Act there is no difference allowed.

In all the foregoing Acts, the Gas-Works Clauses Act and the general Acts relating to gas supply are incorporated; and the borrowing power of each company, when not specified, amounts to one-fourth of their respective capitals.

Of the Acts having for their object the extension of the powers of companies already possessed of statutory powers, the first in alphabetical order is the Bath Gas Act. By this Act the limits of the company's district are extended so as to include several adjoining parishes, and Box and Ditteridge, in the county of Wilts. The maximum price of gas within the limits of the companies Act of 1856 is to be 3s. 9d., and beyond those limits 5s. 6d. per 1000 feet; the illuminating power remains unchanged. The company are authorized to raise £50,000 additional share capital, the dividends on which are limited to 7 per cent.; and they are also empowered to construct a railway or tramway connecting their works with the Midland Railway. The company are prevented from erecting any works for the manufacture of gas in the extended limits. In the Bill the price of 5s. 6d. per 1000 feet was named for the extended districts, and it was provided that the company should at all times charge 1s. per 1000 feet more in those districts than within their former limits. There was a clause, also, providing that when the price charged in Bath to private consumers was reduced to 3s. per 1000 feet, the price charged for the gas supplied to the public lamps should be 3d. per 1000 feet less. There were clauses respecting the supply of gas to the street-lamps in that case by partial meter indication, but all those clauses have been omitted in the Act.

The Belfast Gas Act empowers the company to increase their present share capital of £106,000 to £200,000, and to purchase additional land, not exceeding 16 acres, including that already possessed. They are also authorized to divide the present £80 shares into shares of £20 each; the additional shares being of the same nominal amount. The prescribed rate of profit to be received by holders of ordinary shares of the additional capital is not to exceed 7 per cent., and the dividend on preference shares is limited to 6 per cent. The maximum price of 14 sperm candle gas is to be 4s. 6d. per 1000 feet, and the price charged for the public lights is not to exceed that charged to any private consumer. There is no purity clause in the Act. In the Bill as lodged no allusion was made to the price or quality of the gas, nor was there any limitation on the dividends payable on the new shares.

The Brierley Hill Gas Act sanctions an agreement between the Brierley Hill District Gaslight Company and the Kingswinford Gas Company for the transfer of the works of the latter, on consideration of receiving 375 paid-up shares of £10 each of the former company, together with a money payment of £280. The present capital of the Brierley Hill Gas Company of £11,750 may be raised to £60,000, but the prescribed rate of dividend on the new ordinary shares is limited to 7 per cent., and if preference shares be issued, to 6 per cent. The maximum price of gas named in the Bill, without any explanation, was 6s. 6d. per 1000 feet, and the illuminating power 10 candles; but in the Act the price is reduced to 5s. 6d., and the standard of illuminating power is raised to 13 candles. In fixing that price it is stated to be in consideration that Brierley Hill is a mining district, and the pipes are liable to be broken by the sinking of the ground; that the population is scattered; and that "it is essential to provide a remunerative "price for the supply of gas." The gas for the public lamps is to be charged the same as that supplied to the most favoured

private consumers; but the company are not compelled to supply any public lamp at a greater distance than 25 yards from a main.

The Chesterfield Water-Works and Gaslight Company's Extension Act empowers the company to raise, by the creation of additional shares, £27,000, which are to be sold by public auction, the amount of the premiums on which is not to be entitled to dividends. The prescribed rate of dividend on the new shares is to be 7 per cent. The price of 15-candle gas within the borough, and half a mile beyond, is not to exceed 4s. per 1000 feet; within half a mile of that boundary, 4s. 6d.; and beyond that distance, 5s. The public lamps in the borough are to be supplied at a rate not exceeding 3s. 3d. per 1000 feet. The maximum price named in the Bill was 5s. per 1000 feet for all distances; there was no special provision for public lighting, and no standard of illuminating power.

The Act of the Crystal Palace District Gas Company merely authorizes them to raise additional capital to the amount of £100,000. The prescribed dividend is to be 7 per cent. on the new ordinary shares, and 6 per cent. if issued with preference. In the Bill there was no limitation of dividends on the additional capital.

The Exeter Gas Act repeals and consolidates the Acts relating to the Exeter Gaslight and Coke Company and the Exeter Commercial Gaslight and Coke Company, and empowers the consolidated company to raise £20,000 additional share capital. The present share capital of the company consists of £40,000 original stock, and they have expended £11,000 out of profits, £10,000 of which is converted by the Act into 4 per cent. preference stock. The additional capital may be raised either by ordinary or preference shares, one-half of which are to be sold by auction, and the residue may be distributed as a majority of the shareholders may direct. Any amount received as premiums on the sale of the shares is not to be entitled to dividends. The prescribed rate of dividend on the new shares is limited to 7 per cent., and it is provided that in case the profits are not sufficient to pay the prescribed dividends, no part of the deficiency is to be made good out of the profits of any subsequent year, nor out of any other funds than the reserved fund provided by section 31 of the Gas-Works Clauses Act, to which fund the sum of £6000, being the reserved fund of the old gas company, is to be carried. The illuminating power of the gas is to be 14 candles, tested for purity in the ordinary manner, and the maximum price 4s. per 1000 feet—4s. 6d. having been named in the Bill. The supply of gas to the public lamps may be by meter, one to every lamp, or otherwise, at the option of the Exeter Improvement Commissioners, who are to provide and fix the meters if required. The prescribed dividend named in the Bill, on the £10,000 stock, as well as on the additional capital, was 7½ per cent. without preference. The borrowing powers of the company have also been limited by the Act to £7500, the amount stated in the Bill having been £17,500.

The sole enacting clause of the Glasgow City and Suburban Gas Company's Act provides that the valuation of all the underground pipes and works of the company, for assessments under the Glasgow Police Act, shall be one-fourth of the value thereof entered in the valuation rolls.

The Hastings and St. Leonards Gas Act authorizes the company to increase their present capital of £41,250 to £60,000, the dividends on the new shares, which may have preference attached, being limited to 7 per cent. The shares are to be sold by auction, and the money received as premiums is not to be entitled to dividends. The maximum price of the gas is to be 5s. per 1000 feet, and its illuminating power 14 candles. There was no limitation of dividends in the Bill, nor was the price and illuminating power mentioned.

The only part of the Highbridge Markets and Gas (Amendment) Act that relates to gas is the authorization of the purchase of additional land for the gas-works.

The Leamington Priors Gas Company's Act empowers the company to extend their limits to a district within five miles in every direction from their existing works, excluding the borough of Warwick, and to increase their share capital from £30,000 to £100,000, The new shares may be with or without preference at the option of the company, the rate of dividend being limited in the case of ordinary shares to 7 per cent., and on preference shares to 6 per cent. There is no provision as to the distribution of the new shares. The price of gas within half a mile of the boundary of the parish of Leamington is not to exceed 4s. per 1000 feet to private consumers, and 3s. 6d. for the public lamps, "any contract to the contrary "notwithstanding." Beyond that distance the maximum price is to be 5s. 6d., and the public lamps are to be supplied at the lowest price charged to any private consumer. The provisions respecting public lighting are in other respects peculiar. The company are to light, clean, extinguish, and repair for 13s. per lamp per annum, and the gas consumed is to be estimated by partial meter indication, in the proportion of one meter to every twelve lamps, with a pressure-regulator to every lamp. The illuminating power of the gas is to be such as "to produce "from a steatite Argand burner, having an external diameter of "1·10 of an inch and an internal diameter of 0·50 of an inch, "and having 15 holes, each hole of the diameter of 0·05 of an "inch, and with a 7-inch chimney supported upon an ordinary "gallery with a perforated disc, a light equal to the intensity of "14 uncased sperm candles." The gas is to be tested for purity in the usual manner. None of the provisions respecting public lighting were contained in the Bill, nor was the kind of burner specified; the illuminating power named was 12 candles, and the price within the parish was 4s. 6d. per 1000 feet, instead of 4s. There was a special clause in the Bill prohibiting the company from supplying gas in the district of the Warwick Gas Company, which is omitted in the Act, the limits being specified in a previous clause.

The Liverpool United Gas Act authorizes the company to increase their present share capital of £638,837 by the creation of additional shares to the amount of £300,000, the dividends on which are limited to 7 per cent. The company are also empowered to borrow £60,000; and their power to purchase and hold land is extended from 28 to 60 acres. The gas supplied is to be "of the best and purest quality," and its illuminating power is to be not less than 20 candles. The remuneration of the directors may be increased at a general meeting of the company from £500 to a sum not exceeding £1200 per annum. In the Bill the company sought to increase their reserve-fund to an amount equal to 6 per cent. on their capital, but that clause is omitted in the Act, in which is added the clauses limiting the dividends on the new shares and specifying the quality of the gas.

The Preston Gas Company are authorized by their Act to double their present share capital of £120,000, the dividends on the new shares being limited to 7 per cent., and they may be allotted among the present shareholders. The company may borrow on their existing capital the sum of £30,000, in addition to one-fourth of the amount of the new shares. The quantity of land that may be held by the company is extended from 12 to 24 acres. The price for gas of the illuminating power of 18 candles is limited to 4s. 2d. per 1000 feet within the borough. In the township of Fulwood the gas is to be supplied to the public lamps at the same rate as in Preston, and until the private consumption of gas in Fulwood amounts to 1 million feet per annum, the ordinary price is not to be more than 10d. above the price charged to private consumers in Preston. Discounts are to be allowed, varying from 10 to 20 per cent. It is provided by a special clause that the supply of gas may be cut off from any consumer who does anything in contravention of the Act. In the original Bill the company required power to raise £180,000 additional capital, on which the dividends were to be limited to 7½ per cent., the standard of illuminating power was 14 candles, and no distinction in price was made in Fulwood. There was also a clause for changing the maximum price with alteration in the price of coal, but it is omitted in the Act.

The Ramsbottom Gas Act authorizes the company to increase their present capital of £10,000 by the creation of new shares to £50,000, the dividends on which are limited to 7 per cent. The maximum price for 14-candle gas is to be 5s. per 1000 feet. In the Bill there were no provisions respecting the limitation of dividends on the new shares, nor as to the price and quality of the gas.

The Rossendale Union Gas Act empowers the company to double their present share capital of £50,000, the dividends on the new shares being limited to 7 per cent. The illuminating power of the gas is to be 14 candles, and the maximum price 5s. per 1000 feet. The requirements of the company in the Bill were limited to the increase of capital, no allusion having been made to dividends, nor to the price and quality of the gas.

The South Metropolitan Gaslight and Coke Company's Act is limited in its object to granting power to the company to

purchase additional land, and to extend their works, including in the purchase the district church of Christ Church, Camberwell. The conditions on which the church is to be purchased are, that the company shall provide a convenient site for the erection of another church, and pay into the hands of trustees a sufficient sum of money to be agreed upon, for the building of a new church equal in all respects to the existing church.

The Southampton Gas Act authorizes the company to capitalize the sum of £20,000 expended on the works out of profits, making the present capital of the company amount to £70,000; and they are empowered to raise an additional capital of £60,000. The prescribed dividend on the capitalized profits is 5 per cent., and on the additional shares 6 per cent. if preferential, and 7 per cent. if ordinary. The gas is to be of the illuminating power of 14 candles, and, "as far as "reasonably practicable, free from ammonia or sulphuretted "hydrogen, and other compounds deteriorating its purity." The maximum price within the town and certain prescribed limits is to be 4s. 6d. per 1000 feet; beyond those limits, 5s.; and in the extended district, defined in the Act, 5s. 6d. per 1000 feet. All new mains are to be laid, wherever practicable, not more than 2 feet from the water-mains. The gas supplied to the public lamps is to be charged as low as to any private consumer, and the quantity consumed is to be estimated by average meter indication, at the option of the corporation, the number of meters being one to every ten lamps. Power is given to the company to purchase the works of the Shirley and Freemantle Gas Company, Limited. In the Bill 7½ per cent. was named as the prescribed dividend on the additional capital, the illuminating power of the gas was fixed at 12 candles, and the maximum price, without variation, at 6s. per 1000.

The Torquay Gas Company were authorized by their Act of 1860 to raise a share capital of £25,000, of which they have raised and expended £21,800; and the Act of last session empowers them to raise, by the creation of preference or ordinary shares, £23,200, so as to make the total share capital amount to £44,000. The rate of dividend payable on ordinary new shares is limited to 7 per cent., and on preference shares to 6 per cent. The quality of the gas is raised from 10 candles, as named in the former Act, to 14. In the Bill there was no allusion to the illuminating power of the gas, nor to the limitation of dividends on the new shares.

The third group of Acts, which grant powers to local authorities for the purchase of gas-works, and for the supply of gas, consists only of three, as follow:—

The City of Ripon Act sets forth an agreement between the gas company and the corporation for the purchase of the gas-works for the sum of £9500, which agreement is confirmed. For more conveniently carrying the Act into operation, the corporation are authorized to appoint a gas committee to manage the gas affairs. The maximum price of gas for three years from the passing of the Act is not to exceed 6s. per 1000 feet, and after that period 5s. 6d.; and its illuminating power is to be 14 candles. The corporation are to provide apparatus to test the quality of the gas; and it may be tested on the requisition of 20 consumers, by order of two justices not members of the corporation, 24 hours notice being given before the experiment. If the gas be found not equal to the prescribed standard, the corporation are to forfeit a sum not exceeding £20. The corporation are authorized to borrow on the security of the rates £18,000, for the purposes of the Act. In the application of the revenue derived from the gas-works, the corporation may, after the 1st of January, 1870, set apart, as a sinking-fund, such a sum as will, in 30 years, be sufficient to pay off the money borrowed; and they may also apply the gas-rents in payment of any charges payable out of the general district rate. The maximum price of gas named in the Bill was 6s. per 1000 feet continuously; and the forfeit to be paid by the corporation, in the event of the gas being below the standard, was £10 instead of £20.

The Middlesborough Extension and Improvement Bill, in which the corporation sought for power to raise a further sum of money to carry on the gas-works, was withdrawn.

Of the 367 sections of the voluminous Oldham Borough Improvement Act, 76 relate to gas and water. The corporation are empowered to take additional lands, and to contract with any Local Board or other persons to supply gas beyond the limits of the borough. The illuminating power of the gas is to be 14 candles, and the maximum price 4s. 6d. per 1000 feet. There are provisions authorizing the corporation to cut off the supply of gas on non-payment of gas-rent or other contravention of the Act. If the water be contaminated by the gas, the corporation are liable to a penalty not exceeding £20, and £10 per day whilst the offence continues; and the penalty if the illuminating power of the gas be proved insufficient is also £20. In the Bill lodged by the corporation the maximum price of gas named was 5s. 6d. per 1000 feet.

That portion of the Ross Improvement Act which relates to gas lighting confirms an agreement made December, 1862, between the commissioners and Mr. James Harris, for the sale to him of the gas-works, mains, and pipes, of which the commissioners were then possessed. The preamble to the Act recites that, "the said works being found altogether insufficient, "and the existing commissioners being unable, for want of "funds, to make the necessary additions to the same, deter-"mined, for the benefit and convenience of the inhabitants," to sell the works. The price to be paid for the same is £2025, and Mr. Harris has supplied the district with gas since January, 1863. He agreed to supply gas to the public lamps at the rate of 5s. per 1000 feet, including lighting and extinguishing, and that the quantity consumed should be estimated by the indications of two meters, one under the control of the commissioners, the other under the charge of himself. In the Act the maximum price of the gas is fixed at 5s. per 1000 feet, and its illuminating power at 14 candles, which is two candles more than was named in the Bill.

The Tyldesley-with-Shakerley Local Board (Gas) Act confirms an agreement made with the gas company for the purchase of their works for the sum of £5000. The Local Board are bound, on receiving notice from the Atherton Local Board or from the Atherton Gas Company, to sell their plant, pipes, and right to supply gas within the township of Atherton, for a sum that shall be equal to twenty years purchase of one moiety of the net rent for gas supplied in Atherton. The gas is to be of the illuminating power of 16 candles, and its maximum price 5s. per 1000 feet. The Board are empowered to borrow, on the credit of the income arising from the supply of gas, the sum of £20,000. In applying the money carried to the credit of the gas account, the Board may, after defraying all expenses attending the manufacture and supply of gas, appropriate the surplus "for the public benefit of the inhabi-"tants of the district." The last clause of the Act provides that the Leigh District Gas Company shall not supply gas within the limits of the Board. The provisions relating to the sale of the mains and pipes in Atherton were not in the Bill; the illuminating power named was 14 candles, and the maximum price 5s. 6d. per 1000 feet.

Of the fourteen Bills that were not passed, eight were for the incorporation of competing companies, including the two Bills of the Commercial Gas Company of Ireland, Limited, for lighting Dublin and Kingstown; the Bills of the Exeter Gas Consumers Company; the Hanley Gas Consumers Company, Limited; the Kent Gas Consumers Company; the Southampton, Shirley, and Woolston Gas Consumers Company; the Shirley and Freemantle Gas Company, Limited; and the Winchester Consumers Company. The Local Government Bill, No. 3, so far as related to giving power to the Local Board of Stroud to establish competing works by confirming the provisional order obtained for that purpose, was rejected. The Guisborough Improvement Bill, to give power to the Local Board to supply gas and purchase the existing works; the Middlesborough Extension and Improvement Bill; and the Bill of the Dundee New Gaslight Company, to give additional powers, were not proceeded with. The Imperial Gas Company's Bill was thrown out by the House of Lords on the second reading. The Blaydon Gas Bill, to give statutory power to the proprietors of an existing gas-work and to form a company, was withdrawn, the works having been sold to the Newcastle and Gateshead Company. The Richmond (Surrey) Gas Bill for the incorporation of an existing company was also withdrawn.

Circular to Gas Companies.

THE *résumé* of gas legislation presented in the foregoing abstract of the Acts relating to the supply of gas passed during the last session of Parliament, affords much matter for serious consideration by all gas companies. They exhibit a continued determination in the Legislature to increase the illuminating power of gas, and to diminish the amount of the prescribed

dividends on new capital employed in gas undertakings, from the 10 per cent. allowed by the Gas-Works Clauses Act, to 7 per cent. on ordinary shares, and to a less per centage on those shares to which preference is attached, or on capitalized profits. There is equally manifest, at the same time, a disposition to discountenance competing schemes. The Bills of all competing companies were either rejected, or they failed on Standing Orders, or were withdrawn—viz., the two Bills promoted by the Commercial Gas Company of Ireland, Limited, for lighting Dublin and Kingstown; the Bill of the Exeter Gas Consumers Company; that of the Hanley Gas Consumers Company, Limited; of the Kent Gas Consumers Company; and of the Winchester Consumers Company. We may also include in the list of rejected competing Bills, the defeat of the attempt of the Stroud Local Board to obtain power to erect gas-works and supply gas, by endeavouring to obtain the confirmation of the provisional order of the Home Secretary giving them that power. The two bills for the supply of Southampton, in competition with the existing company, were withdrawn by compromises. The sale, by agreement, of the works of two gas companies to local authorities was confirmed by the City of Ripon Act and the Tyldesley-with-Shakerley Local Board Act; but in both instances the maximum price which the local authorities required to charge was reduced, and in one case the standard of illuminating power was raised. The local authorities in each case have power to apply the profits arising from the supply of gas—after defraying all the expenses and providing a sinking-fund to pay off the money borrowed—to the diminution of the general rates. The Ripon Corporation, in their capacity of manufacturers of gas, required and have obtained much longer notice to be given before their gas-works can be entered to test the gas, than is usually considered reasonable by gas companies. The six hours notice which the latter have been accused of requiring to enable them to fraudulently improve the quality of the gas before it is tested, has been extended in favour of the Ripon Corporation to 24 hours. The much-vaunted advantages to be gained by the manufacture and supply of gas by local authorities are not, at all events, without exception; for in the case of the town of Ross, the Improvement Commissioners applied to Parliament for an Act to relieve themselves of the onerous duty, the discharge of which is admitted to have been not only unprofitable in their hands, but injurious to the public. The preamble of the Act recites that the commissioners determined, "for the benefit "and convenience of the inhabitants of the said district, to sell "the said works," to a gentleman who has in fact been supplying Ross with gas during the past two years and a half; and one object of the Act is to confirm the agreement by which the works had been disposed of. A condition imposed on the purchaser by the Act, which he possibly did not foresee, is, that he shall supply gas of a superior quality to that which had been supplied by the commissioners. The works are small, and the plan proposed by the purchaser of supplying the public lamps by average meter indication carries that mode of estimating the quantity consumed to an extreme bordering on the ridiculous. It has been agreed that, "to ensure justice "on both sides," *two* of the public lamps of the town may have each a small meter, "one under the care of the commissioners, the other under the care of the proprietors of the "gas-works; and the average of the two to be taken as the "quantity consumed per hour by all the other public lights." No agreement could well be contrived more liable to produce dissatisfaction, or more liable to abuse; and it might be conceived that the purchaser proposed it in mockery of the plan of average meter indication. Considering the attention that has been drawn lately to the question of public lighting, it is remarkable that in the majority of the Acts passed last session there are no provisions on the subject, and in only five instances—viz., in those of the Fareham, Folkestone, Exeter, Leamington, and Southampton Companies, in addition to the absurd one of Ross—has the plan of average meter indication been sanctioned by Parliament. In none of the Acts passed last session, with the exception of the Brierly Hill Gas Act, has the standard of illuminating power been fixed at less than 14 sperm candles. In the Littleborough and Chesterfield Acts it is 15 candles; in the Tyldesley Local Board Act, 16; in the Preston Act, 18; and in the Liverpool Act, at 20 candles. No change has been made in the illuminating power of the gas of the Bath and Ramsbottom Companies from that fixed in their previous Acts. In many instances no standard of purity is prescribed, and in those Acts wherein provisions are made for testing the purity of the gas, the 20 grains sulphur and 5 grains ammonia test has not been introduced. In the Liverpool Act it is merely provided that the gas is to be "of the best and purest quality," and the Southampton Gas Act provides that "all gas supplied "by the company shall be, as far as reasonably practicable, "free from ammonia or sulphuretted hydrogen, and other "compounds deteriorating its purity." The test of purity in the other Acts in which such a provision is introduced is, that the gas shall be "so far pure from sulphuretted hydrogen as "not to discolour moistened test-paper embued with acetate "or carbonate of lead, when this test-paper is exposed for "one minute to a current of gas issuing under a pressure of "five-tenths of an inch of water." The Leamington Act is the only one in which the character and dimensions of the burner defined to be used in testing the gas are different from that of the ordinary Argand burner, having 15 holes, with a 7-inch chimney, except in the Liverpool and Preston Acts, where the testing burner is to be a bat's-wing. We have before noticed and commented on the rejection of the Bill of the Imperial Gas Company in the House of Lords, on the second reading, by an anti-gas faction led on by the bishops. On a general survey of the unprecedentedly large number of gas Acts passed during the last session of Parliament, we perceive little to discourage established gas interests. The diminution of the prescribed dividend on new capital is founded on the fact that the manufacture and supply of gas has attained a degree of stability equal to that of most other manufactures, and it is satisfactory to perceive the disposition of the Legislature to support existing companies against reckless and speculative competition. The only question on which any alarm need be entertained is the prevailing tendency to increase the standard of illuminating power, regardless of the limited supply of cannel coal, without the use of which the quality required in the Acts of last session cannot be obtained.

We have reason to believe that attempts are being made to form new gas companies in several towns in which the existing companies are without statutory powers, or are not under the Gas-Works Clauses Act. The prime mover of this general scheme of threatening to invade the districts of unprotected companies, is said to be an engineer who constituted himself into a "Water Reform Association" in 1851, and who was a conspicuous witness in the parliamentary committee on Metropolitan Water Supply in that year. The success of other speculators in getting their expenses paid by the old companies under similar circumstances offers a strong inducement to enterprising men to venture on the same course. If the example set by the Birmingham and Staffordshire Gas Company in the session of 1864, of meeting their assailants by bringing in a Bill of their own, were followed by those companies who are marked out as fitting objects for attack, such machinations would in all probability be defeated, and their promoters would become the victims of their own speculative manœuvres.

The accounts of the metropolitan gas companies for the year 1864, presented to Parliament in pursuance of the Act of 1860, have just been issued, and we hope to give our usual abstract of them in our next. They exhibit an increase in the prosperity which has attended the operations of the companies since a district was assigned to each of them, and the consumers have now some prospect of participating in the general success, for the Independent Company have announced a reduction in their charge from 4s. per 1000 feet, to 3s. 4d. It appears from the accounts that the profits at the former rate have more than sufficed to pay the full parliamentary dividend, and to add considerably to the reserve-fund, and we presume the directors see their way to a continuation of the present dividends at the reduced price of gas.

Correspondence.

IMPROVED PHOTOMETRIC APPARATUS.

SIR,—Several methods have been proposed in the columns of the JOURNAL OF GAS LIGHTING, for securing exactness in weighing the candle or candles used in photometric experiments while burning, or otherwise, without removal from the position occupied during the photometric observations; but those methods, although admirable in character, seem to me to demand too much trouble and nicety in adjustment and in manipulation for general use.

To secure anything like general acceptance, a method must be found which shall require no very special arrangement of or in the

testing-room—no peculiar care in fitting up the apparatus—no extra trouble in the adjustment of the candle, and by which the operation of weighing shall be at once expeditious and accurate.

I think I may claim to have devised such a method, and one which possesses an additional advantage over the other systems proposed, viz., that the candles and balance are not restricted in position to one end of the photometer bar, but may be used at either end.

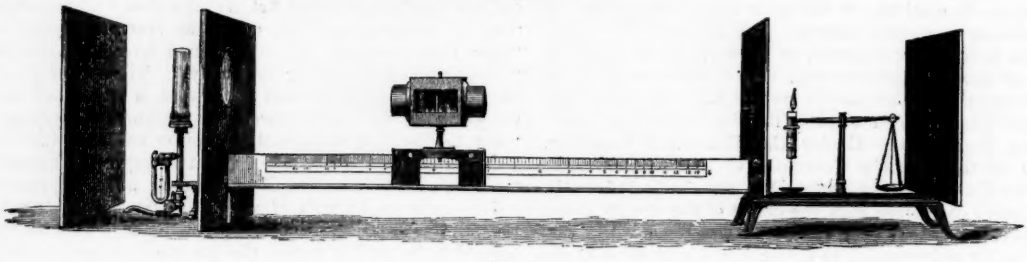


Fig. 1.

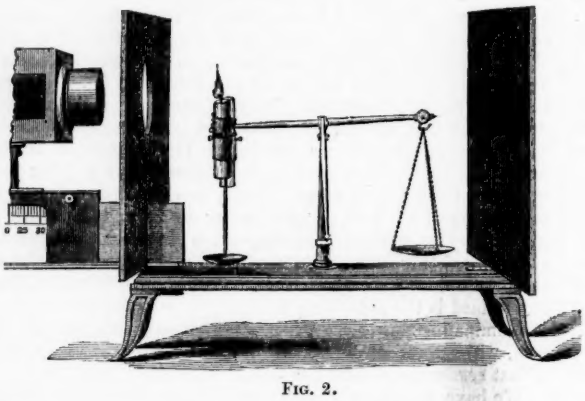


Fig. 2.

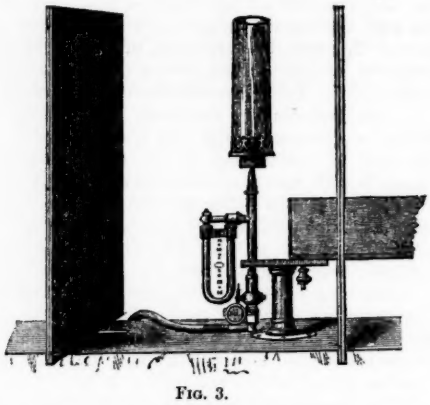


Fig. 3.

Fig. 1 shows the photometer complete with burner, candles, balance, &c., but without meter and governor, which it has not been thought necessary to include in the drawing, the bar being supported by a short gas-pillar at one end and upon a small table at the other. The distance between the centres of the lights may be 50, 60, 75, 100, or any desired number of inches, the rod being graduated in the usual way from a centre point between the lights. The bar may project from either end of the table, and is secured thereto and to the gas-pillar by guide-pins and binding screws, so that no error can be made in fitting up.

Fig. 2 shows the very simple and efficient balance employed, with the candles suspended from the end of its beam. The centre of oscillation of the beam is exactly over the centre of the table, so that if the table be placed at the end of the bar opposite to that to which it is shown attached, it will be only necessary to change the relative suspension points of the candles and scale-pan.

Fig. 3 shows the arrangement of gas-pillar, &c. In this there is nothing very peculiar, except that the plate upon which the bar rests is made with centres for guide-pins in exact agreement with the centres on the ends of the table of the balance, that the worm of the micrometer has two milled heads, and the pressure-gauge two scales, so that whichever side of the pillar faces the operator equal convenience is afforded. F. W. Hartley.

55, Millbank Street, Westminster, July 26, 1865.

METHOD OF SCURFING CLAY RETORTS.

Dear Sir,—Under the head of "Mr. Methven's Method of Scurfing Clay Retorts," which is given in the report of the recent meeting of the "British Association of Gas Managers," Mr. Simpson, of Rugby, by my desire communicated my method of scurfing; but I think he did not go sufficiently into detail, therefore, with your permission, I will give a more minute description in your columns, as it may be of service to some one situated as I am who cannot conveniently adopt Mr. Methven's plan.

My retort is 8 feet 6 inches long, 20 by 15. I have a piece of 3-inch metal pipe 8 feet long. I have also a lid in which a hole is cut so as to allow this pipe to enter the retort; the lid is put on the mouthpiece as if the retort was charged with coal, and the space between the circumference of the hole in the lid and the pipe made air tight, so that all the air that enters the retort must travel the length of the pipe. I take off the cap at the top of the ascension-pipe, and thereby cause a current of air to circulate through the retort. The above plan has a decided advantage, as it acts on the back end of the retort first, thereby keeping that part its original size. William Shimeld.

Gas-Works, Dundalk, July 22, 1865.

Register of New Patents.

2548.—William Edward Newton, of 66, Chancery Lane, in the co. of Middlesex, C.E., for "*Improvements in pumps.*" A communication. Patent dated Oct. 15, 1864.

The first part of the invention consists of a novel construction and arrangement of the chamber containing the inlet-valves, and of the seats of the valves in a double-acting pump. The cover of the valve-chamber is formed by the flange around the cylinder with the same joint, composed of two plain surfaces, as is used to unite the cylinder and sole-plate. The valves may, therefore, be reached on the removal of a small bonnet.

The second part of the invention consists of a novel arrangement of the delivery-valves, and their containing chamber and seats, in relation to the air-vessel and the cylinder, whereby the connexion of the passages of the cylinder with the air-vessel, and that of the cylinder cover with the cylinder, are made by joints having their surfaces in the same plane, so that the labour of facing the surfaces of the joints is reduced.

The third part of the invention consists in constructing the upper part of the air-vessel with a moveable cover, whereby the delivery-valves can be reached without removing or disconnecting the air-vessel, or the delivery-pipes leading therefrom. And the invention consists, finally, in a compound valve of india-rubber and leather of novel construction, whereby the advantages of both of those materials are obtained without the disadvantages of either.

2559.—Alfred Hill, of Birmingham, in the co. of Warwick, M.D., for "*Improvements in privies, dry closets, and commodes, and in deodorizing substances to be used in privies, dry closets, and commodes.*" Patent dated Oct. 17, 1864.

These improvements consist in the mode of arranging the parts of the said privies, dry closets, and commodes, whereby the receptacle of the soil or ordure is closed after the privy, dry closet, or commode has been used, and a measured quantity of a suitable absorbent and deodorizing powder projected on the said soil or ordure.

APPLICATIONS FOR LETTERS PATENT.

1893.—Richard Clark Bristol, of Chicago, in the co. of Cork and State of Illinois, U.S.A., for "*Improvements in slide-valves.*" July 20, 1865.

1915.—Matthew Piers Watt Boulton, of Tew Park, Oxfordshire, for "*Improvements in obtaining motive power when heated air or aëriform fluid is employed.*" July 22, 1865.

1918.—William Edward Gedge, of the firm of John Gedge and Sons, of 11, Wellington Street, Strand, for "*An improved windmill for raising water.*" A communication. July 22, 1865.

1940.—Samuel Lusty, of Walworth, Surrey, machinist, for "*Improvements in fluid-meters.*" July 26, 1865.

1958.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*An improved water-meter, which may be employed as a water, steam, or gas engine.*" A communication. July 28, 1865.

1968.—Ferdinand Küp, of Frankfort-on-the-Maine, gentleman, for "*Improvements in gas-burners.*" July 29, 1865.

1980.—Alfred Vincent Newton, of 66, Chancery Lane, London, mechanical draughtsman, for "*An improvement in refining petroleum and other hydrocarbon oils.*" A communication. July 31, 1865.

1996.—James McEwan, engineer, and William Neilson, builder, both of Glasgow, in the co. of Lanark, N.B., for "*Improvements in the raising, lifting, or drawing and forcing of water and other liquids, and in the apparatus and means employed therefor.*" Aug. 2, 1865.

2008.—John William Perkins, of 41, Norfolk Street, Strand, London, analytical chemist, for "*The purification or refining of hydrocarbons or paraffin oils.*" Aug. 3, 1865.

GRANTS OF PROVISIONAL PROTECTION.

653.—Prospero Carlevario, of Genoa, in the kingdom of Italy, professor of chemistry, for "*Producing a light applicable to photographic purposes, to lighthouses, and to other illuminations.*" June 20, 1865.

1724.—Paul Jacovenco, of Bucharest, Wallachia, at present residing at 11 and 12, Panton Square, Coventry Street, London, for "*Improvements in apparatus for the decantation and raising of petroleum and other oils.*" June 28, 1865.

1732.—George Lizars, gas-meter manufacturer, of 36, Rue Lafayette, Paris, for "*Improvements in dry gas-meters.*" June 29, 1865.

1780.—Hermann Beigel, of Finsbury Square, London, for "*Improvements in the means of obtaining or producing oxygen applicable to various useful purposes.*" July 6, 1865.

1816.—Hector Auguste Dufrené, of 10, Rue de la Fidélité, Paris, and 4, South Street, Finsbury, London, civil engineer, for "*An improved self-acting apparatus for obtaining a circulation of volatile liquids.*" A communication. July 8, 1865.

1818.—George Thomas Livesey, of the South Metropolitan Gas-Works, Old Kent Road, London, for "*Improvements in treating ammoniacal liquors for purifying gas and other purposes.*"—July 10, 1865.

1861.—William Robert Lake, of 8, Southampton Buildings, Chancery Lane, London, for "*Improvements in flexible gas-tubing.*" A communication. July 15, 1865.

1864.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in pumps.*" A communication. July 17, 1865.

1879.—Charles Nicholas, of Cheltenham, plumber, for "*A new or improved apparatus for supplying disinfecting liquids to water-closets, urinals, and other places requiring the same.*" July 19, 1865.

INVENTION PROTECTED FOR SIX MONTHS BY THE DEPOSIT OF A COMPLETE SPECIFICATION.

1893.—Richard Clark Bristol, of Chicago, in the co. of Cork and State of Illinois, U.S.A., for "*Improvements in slide-valves.*" July 20, 1865.

NOTICES TO PROCEED.

717.—George Tomlinson Bousfield, of Loughborough Park, Brixton, Surrey, for "*Improvements in apparatus for vaporizing hydrocarbon liquids for illuminating and heating.*" A communication. March 14, 1865.

791.—James Smith, of Berkeley House, Seaforth, near Liverpool, and Sydney Arthur Chease, of Egremont, in the co. of Chester, for "*An improved arrangement of valves and other appliances for a new description of hydraulic engine for raising water and other fluids above their common level, the fluids so raised to be used as a motive power.*" March 21, 1865.

809.—William Morrant Baker, of 6, Furnival's Inn, London, for . "*Improvements in Argand gas-burners.*" March 22, 1865.

841.—Giacomo Felice Marchisio, of 50, Baker Street, London, gentleman, for "*Improvements in apparatus for obtaining light.*" March 24, 1865.

876.—François Adolphe Mocquard, of 10, Rue de la Fidélité, Paris, for "*Certain improvements in gas-burners.*" March 28, 1865.

900.—Alexander Angus Croll, of Coleman Street, London, civil engineer, for "*Improvements in the manufacture of sulphate of alumina.*" March 30, 1865.

949.—William Brookes, of 62, Chancery Lane, London, civil engineer, for "*Improvements in means or apparatus for obtaining motive power by the aid of steam, gas, or other fluids.*" A communication. April 4, 1865.

980.—George Davies, of 1, Serle Street, Lincoln's Inn, London, and 28, St. Enoch Square, Glasgow, civil engineer, for "*Improvements in the means of, and apparatus for, increasing the illuminating power of hydrocarbon oils and gases.*" A communication. April 6, 1865.

1076.—Joseph Dougan, of Coed Talon, near Mold, North Wales, for "*Improvements in apparatus for distilling hydrocarbons from coal, schists, and other minerals.*" April 17, 1865.

1109.—Francis Wise, of Chandos Chambers, Adelphi, London, consulting engineer, for "*Improvements in gas-regulators and valves for the same.*" A communication. April 20, 1865.

1296.—Edward Myers, of Millbank Row, Westminster, civil engineer, for "*Improvements in wet gas-meters.*" May 10, 1865.

1395.—William Smith and George Browne Smith, both of Kennington, gas-meter manufacturers, for "*Improvements in wet gas-meters.*" May 20, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2059.—George John Yates and John William Ward Tindall, "*A process of deodorizing paraffin, coal, pitch, rock, and other like oils, and hydrocarbons.*" July 19, 1862.

2105.—Toussaint Lemaistre, "*Improvements in privies.*" July 24, 1862.

2127.—Joseph Walton, "*Improvements in the mode of ventilating and heating rooms, Turkish baths, hothouses, and buildings of all kinds.*" July 28, 1862.

2136.—Alfred Noble, "*Improvements in obtaining and treating compounds of alumina.*" July 28, 1862.

PATENT WHICH HAS BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

1565.—Nathan Defries, "*Improvements in apparatus for measuring gas.*" July 12, 1858."

Legal Intelligence.

STAFFORDSHIRE SUMMER ASSIZES.

(*Before Mr. Baron* Channell.)

Saturday, July 22.

THE URTON IMPROVEMENT COMMISSIONERS AND THE LATE MANAGER OF THEIR GAS-WORKS.

DYER *v.* BEST.

This was a case of a somewhat singular character, in which Mr. Charles Dyer, late gas engineer to the Burton Improvement Commissioners, sued Joseph Best, a master carpenter, and a member of the Burton Improvement Commissioners, to recover fourteen penalties of £50 each, or £700. The declaration stated that the defendant being a commissioner of the town of Burton-upon-Trent, became disqualified to act by reason of being personally concerned in a contract between the commissioners and himself for work to be done, and that after he had so become disqualified he acted as a commissioner, by which he incurred a penalty of £50, payable to plaintiff, as informer, for every time he had so acted. To this declaration the defendant pleaded not guilty, and for a second plea, that the acts in respect of which he was alleged to have incurred the penalties were not within twelve months of the time when the action was brought, and therefore that the recovery of penalties was barred.

Mr. Huddleston, Q.C., with whom was Mr. Matthews, was for the plaintiff; and Mr. Gray, Q.C., and Mr. A. S. Hill, for the defendant.

Mr. Huddleston, in opening the case, said the action was brought under the 9th and 15th sections of the Commissioners Clauses Act, which are incorporated with the Burton-upon-Trent Improvement Act. The former of the two sections named, provides that any person who shall, after his election as a commissioner, accept or take or hold any office or place of profit under the Act, or shall be concerned or participate in any contract or in the profit therefrom for any work to be done under the Act, shall cease to be a commissioner, and his office shall thereupon become vacant; and by the latter section it is provided, that any person acting as a commissioner after he has become disqualified, shall be liable to pay to any person informing against him the sum of £50 for every time he shall so act after having become disqualified. Mr. Huddleston impressed upon the jury the great importance of strictly keeping the local governing body of a town free from the temptation to jobbery, to which they would be exposed if they were allowed to pay themselves out of the public money for work done by themselves, and even if they were free from the possibility of taint, and were as honest as Cæsar's wife was supposed to be chaste, they would, if allowed to employ themselves in doing public work, be always exposed to the suspicion and mistrust of the public, from which it was most desirable that they should be free. Recognizing the importance of preventing this, the Legislature in all local Acts inserted provisions of the nature referred to, imposing penalties which might be recovered by any person who chose to sue for them. Generally it was found that a man did not like to put himself in the position of a common informer, and to seek to get penalties under these actions from the persons who rendered themselves liable to them. But sometimes a man got his back rubbed; he felt himself harshly treated, and he said, "If I had been dealt with fairly I would have scorned to bring such an action, but you have done me a great wrong, and I will show you that I have the power to make you make me amends." That was the case with Mr. Dyer, the plaintiff. He now lived at Newport, in the Isle of Wight, but he was formerly engineer at the Burton Gas-Works, which were carried on under the Local Act by the Burton Improvement Commissioners. In 1860 Mr. Dyer went to Burton to take the management of the gas-works, and he conducted them to the satisfaction of every one; and as the price of gas was reduced under his management the ratepayers were very well satisfied. However, Mr. Dyer had occasion to look after a contract which had been granted to a person named Woodiwiss for work at the gas-works. Mr. Woodiwiss's tender was not the lowest, but a strong body of the commissioners being in his favour he got the contract. When Mr. Woodiwiss began to do the work, he entered into certain explanations with Mr. Dyer, which the latter thought incompatible with his position as manager for the commissioners; and Mr. Dyer accordingly, considering that if he adopted the suggestions of Woodiwiss he would be sacrificing the interest of the public, wrote a letter explaining the circumstances to Mr. Gretton, the chairman of the Burton Commissioners. Mr. Gretton, though this was a private letter, handed it over to Woodiwiss, who brought an action against Mr. Dyer for libel at the Chester Assizes, and the verdict was against him, the jury awarding 40s. damages, but Lord Chief Justice Erle, who heard the case, refused to certify for costs. Mr. Dyer, however, was left to pay his own costs, and as he had incurred them in doing his duty faithfully to the commissioners, and by the fault of their chairman in handing over that letter to the person to whom it referred, he asked the commissioners to pay the expenses of that action, which they refused to do. It was in this way that his client was driven to do what he would not otherwise have done—to sue the defendent, Mr. Best, for those penalties by which he might recompense himself the costs of the trial at Chester. The learned counsel went on to state the facts that the defendant, Mr. Best, was a partner in the firm of Best and Bowler, carpenters, of Burton, and that he was a commissioner, and that he did work at the gas-works for the commissioners, which disqualified him from acting as a member of that body, and that after being so disqualified he continued to act as a commissioner, rendering himself liable to pay a penalty of £50 for every time he so acted after he had become disqualified. The jury would see that a question might be raised as to the work being done by Bowler, the partner of Best, but if so, they would, he thought, be satisfied that what Bowler did was shared by his partner Best. Mr. Huddleston also observed that his client left the service of the commissioners in April last, and as that body possessed all the documents which showed what payments had been made, as well as when the defendant had acted as a commissioner, he might be obliged to go into the enemy's camp for evidence, in which case he would of course have to call hostile witnesses.

Mr. *Charles Dyer*, the plaintiff, was then called, and he deposed that he was engaged as gas engineer by the Burton Commissioners in July, 1860, and during the time he held the office the price of gas was reduced, and the consumption more than doubled. Mr. Best, the defendant, was a commissioner during the whole of that time. He attended and took part at the meetings of the board and of committees, and from the time that plaintiff went to Burton defendant went to the gas-works and took orders for work and did various repairs from time to time by witness's orders.

Mr. Huddleston then called for certain accounts from Mr. Coxon, clerk to the commissioners, who was present, and had been summoned by the plaintiff to produce them; and half a dozen accounts were handed in, with

the printed heading Best and Bowler. The first two of these, which were for work done in 1858 and 1859, were paid in November, 1860, and were signed "Settled, Joseph Best." The plaintiff was asked if he could swear that this was the handwriting of the defendant, and he said at first that he knew no other Joseph Best, and then that he had seen Mr. Best write, and believed that the signature in question was that of the defendant. The other accounts were made out to Best and Bowler, or in some cases the name of Best had been erased, and only Bowler left at the heading, and they all purported to have been receipted by Bowler; but as the plaintiff did not know his handwriting, there was no evidence as to the signature. The plaintiff, however, said the work was done by the firm, and that the defendant took orders for it, and that the body of one of the bills was in the defendant's handwriting. The documents were therefore received in support of those settled Nov. 8, 1860, as evidence that the defendant had done work for the commissioners. None of the accounts was for a large sum. To prove that the defendant acted as a commissioner after being disqualified by doing work for the commissioners, the plaintiff produced portions of a Burton paper containing reports of the meetings of the commissioners, and swore that after the several meetings he read these reports and satisfied himself that they were correct, he having been present at the meetings, and on giving this evidence, after a cross-examination by Mr. Gray and an argument, he was allowed to look at the papers to refresh his memory, and he was thus enabled to say that the defendant acted as a commissioner on Sept. 3, 1862; May 6, 1863; July 6, Feb. 3, and June 24, 1864, or five times.

No other witness was examined, and at the close of the plaintiff's evidence the court adjourned at a few minutes before six o'clock.

MONDAY, JULY 24.

Mr. HUDDLESTON, Q.C., addressed the jury in summing up the evidence for the plaintiff, and in the course of his speech told them that he had no doubt his learned friend would, with the eloquence for which he was so distinguished, appeal to their sympathies, and no doubt would denounce the plaintiff as a "common informer;" but he asked the jury to distinguish between the plaintiff, who felt that he had sustained an injury, and took advantage of the defendant having rendered himself liable to these penalties, to vindicate what he thought was his just claim on the board, and a common informer. The learned gentleman suggested that, should the jury give the plaintiff a verdict, the commissioners would probably be more ready to put their hands into their pockets to assist the defendant, their brother commissioner, to pay the penalties which he thought the jury would award him, than they were to pay his costs in action for libel.

Mr. GRAY, Q.C., before addressing the jury for the defendant, raised the question of the right of the plaintiff to sue for penalties being limited to any offence within a year of the time the action was brought, on the authority of the 31st Elizabeth, which enacts that in case the penalties go to the Queen, proceedings must be taken within two years of the time the offence is committed; and where the penalty is divided between the Queen and any other person, proceedings must be taken within one year of the time of the offence; but there was no distinct provision as to a case in which the whole of the penalty went to some person and not any part to the Crown, it being observed that there were no cases of that nature in the time of Elizabeth. Mr. Gray contended that the fair inference was, that as a shorter period was allowed where the Crown had only a portion of the penalty than where the whole went to the Crown, it would be absurd to say that where the Crown had no part of the penalty there was no limitation of time whatever; and he quoted from an old edition of Tidd's Practice a reference to the point, saying that it was in doubt, but that the better opinion was in favour of the view for which Mr. Gray contended—namely, that the limitation to bring such an action was a year, and that the Act referred to should be read—instead of where the Queen *and* any other person was entited to the penalty—the Queen *or* any other person.

The learned JUDGE said he should reserve the point for decision elsewhere.

Mr. GRAY, in addressing the jury for the defendant, said his learned friend had spoken, he would not say as a sneer, for he did not think he had so unkind an intention, but in a style of banter, of his (Mr. Gray's) eloquence. Now, no one knew better than his learned friend, and no one knew better than he (Mr. Gray) did, or could regret it more than he himself did, that eloquence was not a quality which he could claim, but which his learned friend did possess in a remarkable degree. But, though he did not possess that quality of eloquence as did his learned friend, though he was not one of the glibbest of Nisi Prius lawyers, he hoped that he should be able in a plain manner to show them what the evidence really was, and to point out how inadequately the case was proved. Mr. Gray then proceeded to address the jury, and if he did not display eloquence he offered an admirable substitute by observations eminently calculated to influence the jury in favour of the defendant, and to diminish to the lowest possible point the force of the evidence given in support of the plaintiff's case. Mr. Gray said his learned friend had taken great pains to establish that the plaintiff was not a common informer, and he gave a long account of an action for libel, in which the plaintiff asked the Burton Commissioners to pay his costs, and that he was trying to get the costs of that trial by means of the present action. But this made the case worse instead of better, for it was clear that the plaintiff had written a false and malicious libel about Mr. Woodiwiss. It was clearly false, for if it had been true he could have pleaded the truth, and that would have been an answer to the action; and it was clear that it was malicious, or he could have pleaded that the communication containing it was malicious. No doubt, the defendant was anxious not to appear as a common informer, for that was a character which was very infamous. A common informer was a man to whom a chimney sweep would give a wide berth, and who was driven out of every tap-room; and the plaintiff was no better than an attorney's clerk in another case during that assize, who got a publican fined 40s. for having supplied him with ale for which he had asked after legal hours, for in this case the alleged offence of the defendant in doing this work was in connexion with the plaintiff himself, who gave him the orders to do the work. Mr. Gray remarked on the fact, which the plaintiff admitted, that he had now no situation, and that he was bringing another similar action against another person, to recover penalties amounting to £350, and suggested whether, having taken up the trade of an informer, he was coming down gradually from his high stakes that day of £700 to half that amount, and might perhaps descend to the scale of 20s. penalties, and to the position of being kicked out of a dozen public-houses every day. The learned gentleman urged upon the jury that they would attach but slight importance to the evidence of the plaintiff where it was unsupported by documents. He maintained that with regard to the only bills signed by the defendant as being paid in November, 1860, that the work having been done in 1858 and 1859, the defendant was not liable, because according to the Act a commissioner could not sit longer than for three years, and therefore he must have been re-elected after the time the work was done, and in that case he would be newly elected after he had become disqualified by doing the work. The fact that he was afterwards paid for work so done at an earlier time was no reason for disqualifying him from holding his office then, in which the learned judge said he concurred. Mr. Gray, after urging the weak points of the evidence, asked the jury to give the defendant a verdict.

His LORDSHIP, having carefully summed up the evidence, asked the jury to say whether it was proved that the defendant had become disqualified, and if so, to say how often he had been proved to their satisfaction to have acted as a commissioner after having so become disqualified, and to distinguish in how many cases he had so acted within twelve months of the time that the action was brought.

The jury, after discussing the matter in the box, retired, and after being out of court for a considerable period, returned into court and gave a verdict for the plaintiff, finding that the defendant had become liable to pay four penalties of £50 each, and on the question being put to them said there was one case in which the defendant had been proved to have acted as a commissioner within twelve months of the action being brought, and three cases before that time.

Mr. GRAY requested the judge to ask the jury to say which was the instance they relied upon as proving that the defendant had ceased to be a commissioner by doing work for the commissioners, as the declaration only referred to one instance; but his lordship declined to put the question to the jury.

His LORDSHIP said he would enter the verdict for the plaintiff for £200, with leave to the defendant to move to reduce it to £50 on the ground that penalties could not be sued for after the lapse of twelve months. If the defendant should move for a new trial, it would be open for him to urge that he (the judge) was wrong in permitting the witness to refresh his memory by referring to the newspapers, or that he ought to have asked the jury to state which was the specific act by which the defendant was disqualified as a commissioner.

(*Before Mr. Baron* CHANNELL *and a Special Jury.*)

MONDAY, JULY 24, AND TUESDAY, JULY 25.

HAMPTON *v.* THE CRADLEY HEATH GAS COMPANY.

Mr. POWELL, Q.C., with whom was Mr. MOTTERAM, was for the plaintiff; and Mr. HUDDLESTON, Q.C., with Mr. DOWDESWELL, for the defendants.

In this case the plaintiff is a shoemaker at the Five Ways, Cradley Heath, and it appeared that up to a recent period he had a private gas apparatus on his own premises, but on the 23rd of December last, he having asked for the gas of the defendants to be supplied to his house and shop, a service-pipe was inserted into the main, which was on the opposite side of the street to his premises, and was conveyed over to his house. On the afternoon of the 3rd of January the plaintiff with another shoemaker went to a beerhouse on the opposite side of the street, kept by a person named Willetts, and had a glass of beer, and directly after leaving Mrs. Willetts called to him to be so good as to turn on the gas for her, which he had often done before. He went across, and receiving a candle from Mrs. Willetts went down into the cellar, passing into the second cellar where the meter was, and when he raised the candle to see the meter there was a terrible explosion of gas. He was very badly burnt about his hands, face, and head, his hair and whiskers were burnt off, for a week he had a nurse night and day, and she stayed with him for three weeks, and he is still occasionally consulting a surgeon owing to the injuries he received. The explosion blew out windows and doors and did great damage, and a witness who was drinking at the house, and was rather bantered in the witness-box about his indulgence, said he paid for more drink there than he got, for he lost what he had paid for by the explosion. The gas was of course turned off and the main examined, and it was then found that it had a large crack in it into which the blade of a knife could be inserted, from which it was admitted on all sides that the gas escaped, passing through the ground and probably round the service-pipe into the cellar. The case for the plaintiff was that the crack in the pipe was caused by the defendant's man having inserted the service-pipe into the main in a clumsy manner so as to cause the crack, and he claimed from the company compensation for his loss of time, surgeon's and nurse's charges, pain, and so on. The defendants pleaded generally that they had not been guilty of any negligence, and secondly that the plaintiff by his own carelessness in taking a lighted candle into a place where they asserted that he knew gas was escaping had contributed to the accident.

The law of the case was admitted without contention throughout, and was clearly stated by the learned baron, in summing it up to the jury, that the defendants could only be liable for the consequences of the accident if it was caused by their negligence, of course including that of their workmen. That, for instance, if, in inserting the service-pipe, it had been done so as to cause the crack, or if the pipes were so laid that the ordinary traffic passing over them caused the crack, they would be liable, but they would not be liable if the cracking of the pipe was a pure accident, caused by a change in the weather, or by the sinking of the earth from mining operations. But even if the cracking of the pipe was due to the negligence of the defendants, they would not be liable to him if he, by his own negligence, had contributed to the accident.

The main dispute in the evidence was as to the nature of the crack in the main. For the plaintiff, a perspective shaded drawing of the main with the two service-pipes attached—the one leading to the plaintiff's house, and the other to Willetts' public-house—was put in, which was made by Mr. John Millward, consulting engineer, of Stourbridge, a few days before the trial, from a description given to him by Mr. Chandler, an auctioneer, who passed by the place on the day after the explosion, and noticed the piece of cracked main, &c.; and he and two other witnesses deposed that the drawing represented as accurately as possible the crack they saw. According to this representation the crack extended lengthways from the point at which the plaintiff's service-pipe was put in, supporting the view that it was caused by putting in that pipe. The defendant's witnesses, however—Mr. Bradbury, the gas manager, who himself took out a piece of the broken main, a man who helped him, and another man who saw the main, and the chairman of the company (Mr. Edward Moore), who is a surgeon and a magistrate of the counties of Staffordshire and Worcestershire—all said that the crack was quite different in position and direction to the representation on the drawing, that it was across instead of lengthways, and was not within 4 inches of Hampton's service-pipe. The piece of main pipe had been asked for, but was not to be found, on which Mr. Powell, for the plaintiff, remarked. Mr. Bradbury, the gas manager, and another witness who helped him, described how the service-pipe was put in, which Mr. Dyer, formerly gas engineer at Burton, and Mr. Storer, gas engineer, of Stafford, stated was a proper mode; and he and his assistant said that he tested the junction of the service with a light after it was put in, and

found it all right; and Mr. Dyer and Mr. Storer said this was always done in such cases, and they gave it as their opinion that had the crack been caused at the time the service-pipe was put in the gas would have escaped and been perceived much sooner than eleven days afterwards. Mr. Storer was of opinion that the crack had been caused by mining operations, and said he found indications of the ground sinking within 80 yards of the spot; and at the house of Mr. Hodgson, a surgeon, some 120 yards distant, the influence of mining operations was so great that Mr. Hodgson said he could formerly see the church clock, and now the whole of the steeple, through a crack, and that the wall of his pantry gaped so wide that food might be reached through from the outside. On the other hand, the witnesses who lived close to the spot where the explosion occurred said they had never perceived any indications of the ground sinking.

With regard to the question of whether the plaintiff had contributed to the accident by his own negligence, he and a man named Harvey said they were in the public-house just before the accident, and smelt no gas; and he denied that the landlady, Mrs. Willetts, when she gave him the candle to go down and turn on the gas, cautioned him. A person of the name of Paterson, however, who took dinner at the house that day, said he smelt the gas in the passage as he was going away, and warned Mrs. Willets, and the latter said that she had the lights tried in the passage, the kitchen, and the parlour, before the plaintiff went to the house, from smelling gas, but found no signs of anything. She also acknowledged that she went down into the first cellar before Mr. Hampton went in, taking a candle with her; but she said that when she asked him to turn on the gas, she said, "Whatever you do, be careful," and the man who lost his beer by the explosion said he heard this caution. It appeared that, whilst the two cellars were connected by an open doorway, there was a height of about half a yard above the lintel of this doorway built up; and it was suggested that the gas in the second cellar had accumulated in this space under the ceiling before it exploded. Mr. Bradbury, the gas manager, and one of his men, said the plaintiff, after the accident, said he had only himself to blame; which, however, he denied. It appeared that the directors of the company had paid Mrs. Willetts £20, in addition to repairing her premises, and had paid another person £3 odd to compensate for the damage done, and that they had offered to give the plaintiff £5, if that would satisfy him; but it was urged that this was with a view to avoid any further trouble, and was no acknowledgment that they were liable.

The jury, after consulting, found a verdict for the defendants.

Miscellaneous News.

CITY OF LONDON GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Proprietors of this Company was held at the Offices, Dorset Street, on Wednesday, August 2.—Robert Alexander Gray, Esq., in the chair.

The Secretary (Mr. Millar) having read the notice convening the present and the minutes of the last half-yearly meeting, and of the special meeting in May last for the election of an auditor, the seal of the company was affixed to the register of proprietors.

The following report from the court of directors, with the statements of accounts annexed, was then read by the secretary:—

By the minutes of the special general meeting, held on the 24th of May, which have now been read, your attention has been called to the death of Mr. Lamb, which occurred in March, and your directors consider it due to the memory of their late colleague to record in this, their first half-yearly report after his decease, their sense of the loss the company sustained by his removal after having faithfully served the company for a period of 19 years—first as auditor, and subsequently as a director. In both capacities Mr. Lamb evinced much diligence and assiduity, and secured the respect and esteem of all with whom he was associated.

Your directors have now to report that very early in the half year their attention was called by the engineer to the condition of one of the retort-houses, as being at once much dilapidated and not so advantageously constructed as more modern appliances would admit, and after much anxious consideration with your surveyor, they decided that it should be taken down and rebuilt. In the rebuilding, a small portion of the yard has been added to it so as to afford additional retort power, and your directors anticipate considerable assistance from this in meeting the continued increasing demand for gas. The works are in progress, and it is expected the new building will be ready for occupation before the next winter. The cost will be considerable, and your directors have partly provided for the same by charging the half-year's account with the sum of £4000 in part thereof.

Your directors have also to report that, in conjunction with the other two companies who supply the City with gas, they have deemed it expedient to give notice to the Commissioners of Sewers that at Christmas next the price of gas supplied by this company will be reduced to 4s. per 1000 feet. Your directors look forward to an increased demand for gas to prevent any material falling off in the rental. In connexion with this, your directors refer to an intimation, given by the corporation of the City of London, again to apply to Parliament for a modification of the Metropolis Gas Act of 1860. It will be in the recollection of the shareholders that a similar attempt was made in 1861 and was subsequently abandoned. It will be the duty of your directors to watch the present movement, and they will be prepared to take such steps therein as may be needful to protect your interest. Your directors are gratified to be able again to report that the weekly returns of the gas analyst for the City testify that the gas supplied by the company has uniformly been beyond the requirements of the Act of the Parliament.

The accounts for the half year, duly certified, are appended hereto. The rental is £57,700. 18s. 4d., being an increase over that of the corresponding period of 1864 of £3732. 17s. 4d. The profit for the half year, as per No. 1 statement, is £20,769. 18s. 5d.; and the amount at your disposal, as per No. 2 statement, is £23,986. 17s. 1d., subject to income-tax. Out of this amount your directors recommend you to declare a dividend for the half year as follows:—On the A and new shares at the rate of £10 per cent. per annum, and on the B shares at the rate of £4 per cent. per annum; all to be paid free of income-tax.

At the special meeting held in May, to which reference has been made, the chairman stated that in accordance with the provisions of the Companies Clauses Act of 1845 your directors had elected Mr. S. T. Prior, one of the auditors, to fill up, for the time being, the vacancy occasioned by the death of Mr. Lamb. In the order of rotation, Mr. Lamb would have retired at this meeting; and Mr. Prior, as occupying his position, now places his seat at your disposal, but offers himself for re-election. At the same meeting, Mr. Fortescue was elected auditor in the place of Mr. Prior; and by the same order of rotation he now retires, and also offers himself for re-election.

R. A. Gray, Chairman.

Dr. No. 1.—*Statement of Profit and Loss, for the Half Year ending Midsummer*, 1865. *Cr.*

To Cost of coals consumed, including porterage			£24,610	13	6	
Rents, rates, and taxes			1,181	10	6	
Wages			9,297	12	10	
Directors and auditors fees			635	7	6	
Salaries			2,503	0	0	
Tradesmen's accounts			4,086	7	4	
Repair and depreciation of meters			1,184	18	10	
Petty cash disbursements			657	0	11	
Interest			1,553	3	4	
Bad debts, allowances, &c.			640	18	5	
Parliamentary expenses			44	8	10	
Rebuilding retort-house—on account			4,000	0	0	
Balance			20,769	18	5	
			£71,167	0	5	

By Rental			£57,700	18	4	
Balance of profit on sale of company's shares			160	7	0	
Coke			9,594	17	3	
Breeze			599	2	8	
Liquor			679	5	0	
Tar			1,969	6	0	
Old materials, &c.			460	8	4	
Transfer fees			2	16	0	
			£71,167	0	5	
Balance of profit brought down			£20,769	18	5	

Dr. No. 2.—*General Balance-Sheet.* *Cr.*

To Capital				£380,000	0	0		
Debentures, with interest to date				57,165	11	8		
Reserve-fund				5,360	10	3		
Mr. Benham's benevolent-fund				1,062	10	0		
Debts due to sundries				17,743	0	10		
				£461,331	12	9		
Balance carried down—								
Brought forward from Christmas		£	3,216	18	8			
Half year's profit, per No. 1			20,769	18	5			
				23,986	17	1		
				£485,318	9	10		

By Plant				£401,302	11	8
Leasehold property				4,666	0	1
Amount due for light	£24,876	2	2			
Ditto coke, &c.	5,182	16	7			
Ditto sundries	2,864	4	6			
				32,923	3	3
Amount of deposit account	£9,000	0	0			
Ditto of cash on hand	9,180	19	1			
Ditto petty cash	2	18	7			
				18,183	17	8
Stock on hand—						
Coals, &c.	£3,028	4	3			
Materials	2,360	13	10			
Meters	22,853	19	1			
				28,242	17	2
				£485,318	9	10
Balance of profit brought down				£23,986	17	1

J. T. Hadland, W. Fortescue, *Auditors.*

The Chairman: Gentlemen, you have now heard the report and accounts read, and I hope you will concur with the directors in thinking that they present a very favourable statement of the affairs of the company. It is not my intention to trespass long upon your time to-day. I have remarked on former occasions, and also when attending the meetings of other companies, that we have found the statements which are laid before the proprietors for their information and guidance, are sometimes, when they come before the public, as they eventually do, made use of to our disadvantage. It is not always well to convey too much information to the public, for, as I need hardly remind you, when we were engaged in a struggle in the House of Commons some years ago, the materials from which our opponents obtained the evidence with which they sought to annoy and injure us were drawn from the statements made at some of our meetings. I think, therefore, the sooner we abstain from that course the better it will be for us. In carrying on our own private affairs, we think it prudent to keep the details of our position as much as possible to ourselves, and I do not see why a company, which is merely a corporate body, should not pursue a course which commends itself to our minds as the most prudent to adopt. Of course it is the duty, as I am sure it will always be the desire, of the directors to make every one of the proprietors acquainted with the proceedings of the company; and I need not assure the gentlemen whom I have now the pleasure of addressing that if on any matter connected with the report and accounts they require further information, the secretary or the directors will be always most happy to furnish it to them on application. Having said this, I may remark that the working of the company during the past half year has been most satisfactory to your directors. Without occupying much time by entering into the details of the benefits derived by us by those operations, I would merely say that the carbonizing account has been very good, that the price of coke has been rather more than on a former occasion, and that the cost of coals has been rather less. These are the main elements to which we attribute the increased prosperity of the company. I need not remind gentlemen present that a considerable amount of agitation is now going on with respect to the price at which gas is being supplied. To my mind the outcry against the gas companies is a most senseless and unjust one. Every man who embarks his property in a hazardous undertaking of this kind is fairly entitled to a resonable remuneration for the risks to which that property is exposed, and I am not prepared to admit that the price of 4s. per 1000 cubic feet which we are going to charge for gas is at all in excess of that which the proprietors of this company ought to receive. There is one circumstance in corroboration of the soundness of this opinion to which I may briefly allude. You are all aware that during the last session of Parliament investigations took place before several committees with regard to the affairs of gas companies. Before those committees Mr. Flintoff and others attended, and strove to convince the Legislature that 2s. 6d. per 1000 was a sufficient

price for gas; but so little attention was paid to the representations of those persons, that in most of the bills passed the price of gas was fixed at 4s. and 4s. 6d. per 1000 cubic feet. That fact, I think, will place us in a very satisfactory position, supposing that the corporation of the City of London should attempt to carry out the threat in which they have indulged. But I for one cannot believe that people of common sense will take such a course. If they do, I am persuaded that they must produce some better evidence than has hitherto been brought forward to induce Parliament to sanction the erection of works and the supply of gas by them. I should like to know if it is for the benefit of the community that the corporation should undertake the manufacture of gas, what earthly reason there is why they should not go a step further, and undertake to supply the public with porter, and with that end in view ask powers of the Legislature to buy up some of the large London breweries. To me it appears that the one course would be just as reasonable and proper as the other. Gentlemen, we have stated to you in the report that if the corporation should carry their threat into execution, we, in conjunction with the other companies, will use our best efforts to frustrate their design. I do not believe that they would find it an advantageous thing to do. Some years ago the Government took upon themselves to make gas at their penitentiary, but they have since discontinued the practice, for they found that the gas companies could supply them much cheaper than they could make it themselves. With regard to the quality of our gas, I am happy to inform you that though from time to time we have been abused for supplying what was alleged to be an inferior article, it is shown by every report which Dr. Letheby, the gas analyst of the City, has made, that our gas is in excess of the parliamentary standard—in many instances it is more that 20 per cent. above it. I think that is a complete answer to the accusations which have been made that since the passing of the Metropolis Gas Act the quality of our gas has deteriorated. I am quite satisfied that the gas supplied by this company is unexceptionable in every respect. Persons complain sometimes that they are charged for a greater quantity of gas consumed than they formerly were. In all such cases it arises from the careless manner in which the gas is used by the consumers. They have the power to regulate their own consumption by attention to their burners, and if they would do so they would have no reason whatever to complain that their gas costs them more than it used to do. With reference to the presence of sulphur in gas, that is a question which has given rise to a great deal of anxiety, and I dare say you will remember that Mr. Barlow, at the request of the Commissioners of Sewers of the City of London, and with the concurrence of the gas companies, went to Paris to confer with some of the most able chemists there, in order, if possible, to devise some mode by which the sulphur might be got rid of, or the quantity usually present in gas be considerably diminished. But what was the result of their deliberations? They came to the conclusion that they could suggest no means by which that end could be accomplished. You are aware that according to the terms of the Act of Parliament a standard is laid down by which the maximum quantity of this impurity is 20 grains per 100 cubic feet of gas. It is gratifying to me to be able to state that by the careful method in which the gas of this company is manufactured, the amount of sulphur existing in it has, with very rare exceptions, during the past six months, never exceeded the parliamentary standard. When it has been in excess, it has only been to a very trifling extent. I have now before me the report of Dr. Letheby for the past week, which is very similar to many antecedent ones, in which he states that the illuminating power of the City Company's gas has been fully equal to the requirements of the Act of Parliament, and that the amount of sulphur present per 100 cubic feet has been 18·1 grains instead of 20 grains. I think that ought to satisfy the public that every means is adopted by this company to supply gas of the purest quality and of an illuminating power beyond even the parliamentary requirement. Gentlemen, I do not know that I need trespass further upon your time; I will, therefore, only say that if any proprietor desires to ask a question before the motion with which I am about to conclude is put, I shall be most happy to answer him. I move—"That the half-yearly report of the directors now read be received and adopted."

Mr. HADLAND (deputy-chairman) seconded the motion, which, as no one rose to speak thereon, was at once put to the meeting, and carried unanimously.

Sir CHARLES PRICE, Bart., said, after the very satisfactory report which had been read, and the able remarks made by the worthy chairman, the proprietors would not be surprised at the terms of the resolution he was about to submit. He thought that probably a more satisfactory report had never been laid before a meeting of the proprietors than that to which they had just listened—a report which seemed to hold out the prospect of a gradual settlement of all those difficulties with which the company had had to contend for many years. In every respect their prospects seemed to be as bright and cheering as they could reasonably hope and expect. Under such circumstances it was not necessary for him to detain the meeting with any remarks in support of the following resolution, which he had much pleasure in proposing:—"That agreeably to the recommendation contained in this day's report of the board of directors, a dividend out of the profits of this concern for the half year ending at Midsummer last be now declared as follows:—On the A and new shares at the rate of £10 per cent. per annum, and on the B shares at the rate of £4 per cent. per annum. The whole to be paid, free of income-tax, at the company's office, on the first Tuesday in October next, and on each succeeding Friday and Tuesday, between the hours of twelve and one o'clock."

Mr. RICE seconded the resolution, which was put, and carried unanimously.

Mr. LAVANCHY said a motion had been placed in his hands which required very little recommendation. It had reference to the re-election of one of the directors, who, in accordance with the regulations of the company, vacated his seat at this meeting, and, being eligible, offered himself for re-election. The proprietors must be convinced, from the admirable way in which Mr. Prior had discharged his duties in the past, that he was fully qualified for the post to which he had been appointed; and therefore he had great satisfaction in moving—"That Samuel Turner Prior, Esq., be re-elected a director of this company."

Mr. FENN seconded the motion, remarking that Mr. Prior and his ancestors had been connected with the company from its first formation, and if a person so circumstanced had not the best interests of the undertaking at heart it would be difficult to find any one who would have. He hoped that for many years to come Mr. Prior would be spared to occupy a seat on the direction.

The CHAIRMAN, on putting the resolution, which was very cordially adopted, expressed the satisfaction he felt in seeing Mr. Prior at the board, and in knowing that the good opinion he had always entertained of that gentleman's abilities had been amply sustained.

Mr. PRIOR said he felt extremely obliged by the very handsome manner in which the proprietors had received the motion which placed him again on the board of the City of London Gas Company. He could assure the meeting that he took the deepest interest in the prosperity of the concern, and it was a source of great gratification to him to see the accounts of the company in so favourable a position. He congratulated the proprietors most warmly on their prospects, and would only add that nothing would be wanting on his part in the faithful discharge of the duties which devolved upon him in connexion with the office to which he had been just re-elected.

Mr. WARREN moved—"That William Fortescue, Esq., be re-elected an auditor of the company." He believed that, though he had occupied the position of an auditor but a very short time, Mr. Fortescue had discharged his duties with fidelity, and to the satisfaction of the proprietors, to whom his re-election would no doubt be gratifying.

Mr. FENN seconded the motion with much pleasure, having had the gratification of knowing Mr. Fortescue's father, who was one of the oldest proprietors of the company, for many years.

The motion was put, and carried unanimously.

Mr. FORTESCUE acknowledged his obligations for the honour conferred upon him. It was, he said, truly gratifying to him, on the occasion of his first audit, to have such good accounts to certify, and he hoped for many years to come it would be his privilege to verify accounts at least equally satisfactory. No effort would be spared on his part to ensure the approbation of those who had elected him to his important office.

Mr. RICE moved—"That the best thanks of the meeting be given to the chairman, deputy-chairman, and the board of directors, for their attention to the interests of the company during the half year."

Mr. G. B. WHITE seconded the motion, which was put to the meeting by Sir Charles Price, and very heartily responded to.

The CHAIRMAN, in acknowledging the vote, said he would very briefly revert to the accounts. It was stated in the report that the directors were making an addition to the retort-house, to enable them to meet the increasing wants of their customers. They had deemed it prudent to take a sum of £4000 out of the undivided profits towards the expense of that building. The state of the accounts was that they had carried down £23,986. 17s. 1d., after deducting this £4000. They had previously £5360. 10s. 3d. in reserve, and after providing the present dividend they would have £7986. 17s. 1d., making together £13,347. 7s. 4d., in reserve, which he thought was a state of things very satisfactory. The directors felt that it would be prudent to keep this in reserve, for no one could tell what might happen in consequence of the proposed reduction in the price of gas; and it must be obvious to the proprietors that the value of their property mainly depended upon having a dividend which did not fluctuate. The directors would continue that course, and he sincerely hoped that, notwithstanding the agitation, and though the company might be in a little worse position by the reduction of price, they would still be able to pay the proprietors the same dividend next half year. For himself, he had to thank the meeting for the kind manner in which they had expressed their approbation of his conduct, and he could assure them that, so long as he had the honour of a seat at the board, he would do nothing to forfeit the good opinion which for so many years they had expressed respecting him. He would leave his colleagues to speak for themselves.

Messrs. Hadland, Kenneth, and Ward, in a few words, severally returned thanks.

On the motion of Mr. RUTLAND, seconded by Mr. FENN, a vote of thanks was accorded to the auditors for the great care bestowed by them upon the investigation of the accounts of the company.

Mr. J. T. HADLAND acknowledged the vote for himself and Mr. Fortescue, expressing his satisfaction at having that gentleman for his colleague, and that they had had such an excellent set of accounts to audit on the present occasion.

Mr. G. B. WHITE proposed a vote of thanks to the secretary.

Mr. G. S. CAULFIELD seconded the resolution.

The CHAIRMAN said he was much pleased that the worthy proprietor had proposed a vote of thanks to Mr. Millar, who was fully entitled to the confidence of the meeting. For himself he would say that Mr. Millar stood as high in his estimation as he had ever done, and he believed that a more zealous officer it was impossible for a company to have.

The motion was put, and carried unanimously.

The SECRETARY said: Gentlemen, I feel greatly indebted to you for this expression of your approval of my services. I have again and again said that I have never brought to the interests of this company great talents; I hope I have brought integrity and a determination to do my duty. It is peculiarly gratifying to me, after 45 years of service in this company, to hear our esteemed chairman express himself as he has done. I hope as long as I am spared I shall continue to secure the good opinion of the board and the confidence of the proprietors. It will, I assure you, be my aim to do so.

The proceedings then terminated.

GAS PRODUCTS UTILIZING COMPANY, LIMITED.

An Extraordinary General Meeting of the Shareholders of this Company was held at the London Tavern, on Wednesday, August 2—A. A. CROLL, Esq., in the chair.

The SECRETARY (Mr. Guyatt) having read the notice convening the meeting,

The CHAIRMAN said this extraordinary meeting had been called for the purpose of confirming an alteration already adopted in one of the provisions of the Deed of Settlement, so as to enable the company to hold their ordinary meetings in the month of August instead of in October. He formally moved—"That the following alteration in the Deed of Settlement be confirmed:—Subsequent general meetings shall be held at such time and place in the months of February or August in every year as may be determined upon by the directors."

The motion was put, and agreed to.

The second ordinary general meeting of the shareholders was then held.

The SECRETARY read the following report of the directors:—

The directors have much pleasure in meeting the shareholders and submitting their second report, from which it will be seen that the general business of the company during the past year has been satisfactory.

Your directors have adopted the same course in reference to the examination of the accounts as upon the last occasion. The balance-sheet and profit and loss account now presented have undergone the scrutiny of Messrs. Quilter, Ball, and Co., in addition to the auditors appointed by the shareholders, all of whom certify to their accuracy.

These accounts embrace the operations of the company for the first twelve months ending the 30th of June last, and your directors trust that the figures may prove as gratifying to you as they are to them.

From these statements you will observe that, after deducting all trade charges, salaries, interest on debentures, discounts, directors and auditors remuneration, and 20 per cent. of the preliminary expenses, the net profit accruing from the first year's operations amounts to £7499. 8s. 6d., from which has to be deducted £2337. 1s. 10d., the amount paid in dividends in February, the £1000 placed to the credit of the reserve-fund by resolution of the shareholders at the last meeting, leaving a balance of £4162. 6s. 8d. available for division on the present occasion.

From this sum the directors propose and recommend the payment of a dividend of 5 per cent. free of income-tax for the six months ending the 30th of June last, making with that paid in February, 10 per cent. for the year. This will absorb the sum of £2700. 6s. 1d., and your directors further recommend the transfer of £1000

to the reserve-fund, making the amount to the credit of that account £2000. The balance—£462. 0s. 7d—to be carried forward.

Your directors, anticipating your acquiescence in these recommendations, have had the dividend warrants prepared, to be handed to the proprietors present, immediately after the meeting, and forwarded to those unable to attend.

Your directors have to announce the retirement of Mr. Stephenson Clarke from the direction, in consequence of his increasing engagements. In pursuance of Article 93 of the Articles of Association, they have unanimously elected Lord Alfred Spencer Churchill to the vacant seat at the board.

With the view of meeting the increasing business of the company, your directors have entered into a contract for the erection of additional sulphuric acid chambers at Bow Common, and notwithstanding a temporary suspension of these extensions, through the fault of the contractor—which event, although not expected, is provided for in the agreement, which indemnifies the company from loss—they hope to have them in operation in time for the supply of the extra quantity required in the early part of the next year, not only for the company's own use, but to enable them to execute the large contracts already in hand.

The resident manager thus reports upon the condition of the works:—

"*The Gas Products Utilizing Company, Limited,*
"*Works, Bow Common Lane, August 1st*, 1865.

"Gentlemen,—I beg to report that the whole of the plant and machinery at your works is in good working order and in most efficient condition.

(Signed) "J. CHAPMAN, Resident Manager.

"To the Directors of the Gas Products Utilizing Company, Limited."

The CHAIRMAN, in moving the adoption of the report, said he thought it would be readily admitted that, though short, it was very satisfactory. The directors proposed to give to the shareholders a 10 per cent. dividend, while the earnings of the company during the year had been at the rate of nearly 15 per cent. It might be asked by some of the shareholders—"Why, if we have earned nearly 15 per cent., do you only give us 10 per cent.?" To that inquiry the directors answered that they thought it very much better to be on the safe side; and he had no doubt the shareholders would give the board credit, at any rate, for a desire not to make a bad use of the surplus profits. He hoped the period was not far distant when the board might feel inclined to recommend that the shareholders should participate of those profits to a larger extent than 10 per cent.; in the meantime they felt that it was wise not to go too far, or to give them too much for their money. There were three circumstances to which he might refer as indicating very clearly, he thought, the estimate which men who were fully capable of judging had formed of this company. The directors had had, during the last six months, offers made to them to purchase the goodwill and business of three different establishments. The first was comparatively a small affair. It was offered to them upon favourable terms, but it was thought objectionable, because the works were erected on leasehold property, and the lease had only some 16 or 20 years of its term unexpired. On that account the board would have rejected it, although no other obstacle had existed. The second offer was that of a very large establishment, the purchase of which would have amounted to between £70,000 and £80,000. The directors, however, thought it injudicious and unwise to purchase those works, because although to a considerable extent they were engaged in the conversion of the residual products from gas, and so far offered a legitimate occupation for the capital of the company, they were also engaged in a manufacture which, to some extent, was rather uncertain, and the profits of which might vary materially. On that account, therefore, they had refused the offer. The third offer was of a more satisfactory nature. The terms of purchase were very favourable to the company, and the offer had that day been accepted by the directors. He had no hesitation in saying that if the negotiation were carried out it would tend materially to increase the profits of the company. It would, of course, be unwise, in the existing state of the transaction, to refer more specifically to it; he would, therefore, only say that the shareholders might rely upon the directors exercising a wise judgment in the matter, and declining to enter upon any fresh undertaking unless there were an almost absolute certainty of its producing good results for the company. There was one condition in reference to all three of the offers which he might mention, and that was, that the parties desired to receive a very large proportion of the purchase-money in shares of the company. In the case he had just named, the sellers desired to have one-half of the payment made to them in shares. The directors refused to accede to that proposal, because they felt that whatever necessity there might be either for a call or for the issue of more shares by-and-by, the present proprietors ought to have the advantage of it. He did not know that it was necessary he should occupy more time by making further observations. He would only add that he believed they would go on prosperously, and that they might look forward to a great many meetings of this kind, of a character equally as pleasant and satisfactory as the present. He moved—"That the statement of accounts and the report just read be received and adopted."

Lord ALFRED SPENCER CHURCHILL seconded the resolution. In doing so he said he was certain that the proprietors must be fully satisfied with the rate of dividend offered to them on this occasion. Although he had recently joined the board he was able to assure the meeting that the directors were paying the utmost attention to the development of the business of the company in every possible way.

The motion was put and carried unanimously, and a dividend in accordance with the recommendation in the report, at the rate of 10 per cent. per annum, free of income-tax, was then declared.

A very cordial vote of thanks was adopted to the chairman and board of directors, for their excellent management of the affairs of the company.

The CHAIRMAN, in responding on behalf of himself and colleagues, said such an expression of approval on the part of the proprietors would stimulate the board to, if possible, increased exertions, to promote the interests of the company. As stated in the report, the directors anticipating the concurrence of the meeting in the dividend recommended, had had the warrants prepared for its payment, upon the principle that if it were right to do a thing, the more promptly it were done the better.

Mr. J. W. BALDWIN proposed a vote of thanks to the secretary and resident manager, for the very able and efficient manner in which they had performed their duties during the past year.

Mr. J. A. CROOKENDEN seconded the motion, and said that having gone through the accounts he could bear his testimony to the admirable manner in which the books of the company were kept.

The CHAIRMAN, in submitting the resolution to the meeting, said it gave him great pleasure to do so. He believed that both of these gentlemen had the best interests of the company at heart, and that they begrudged no amount of labour in the performance of their duties.

The motion was put and carried unanimously.

The SECRETARY said on behalf of the resident manager and on his own behalf, he thanked the proprietors most heartily for this mark of their approbation, which, if such a thing were necessary, would be an additional stimulus to them to exert themselves on behalf of the company.

THE LONDON GAS-METER COMPANY, LIMITED.

The Second Ordinary General Meeting of this Company was held at the Guildhall Coffee House, on Friday, the 4th instant—G. SCAMELL, Esq., in the chair.

The SECRETARY (Mr. J. T. Bedford) read the notice convening the meeting, and the report of the directors, which stated that the accounts for the past half-year, ending June 30, showed a balance in favour of the company of £1689. 7s. 8d. The directors recommend that one-half of the amount of preliminary expenses be written off, thus extending the period of their payment over three years from the commencement of the business; that a dividend at the rate of 7 per cent. per annum be now paid, free of income-tax; and that the balance of £533. 7s. 1d. be carried forward to the credit of next account. The directors having had an offer on favourable terms of a small business in Germany, possessing, as it appears to them, most remunerative prospects, they had after full consideration determined upon taking it on trial for 12 months, reserving to themselves the power, if it did not prove so advantageous as they anticipated, to discontinue it at that time, without any liability beyond the small working expenses that might be incurred during that period. The usual difficulties attending the completing and bringing into use the new patents of the company having now been to a great extent overcome, the directors had every reason to believe from the high character their meters had received from the various companies using them, that the company would continue increasing in business and prosperity.

The CHAIRMAN, in moving the adoption of the report, stated that he believed a good foundation had been laid for the business of the company, and that a very prosperous future was before them, to which prosperity the improvements introduced into their working arrangements would largely contribute. The company possessed an excellent staff; the enlargement of their works, to which reference was made on the last occasion, was now complete, and the whole of their affairs were progressing to the satisfaction of the board. With reference to the accounts, he remarked that the result of the half-year's working was a profit of £990. 8s. 10d. The shareholders would observe in the accounts an item of £550 for forfeited shares. There were two ways of dealing with that amount—either they might have added it to capital, and so carried it forward as an item of property belonging to the company, charging it with a proportionate amount of profit; or they might deduct it from the capital in the way which the directors had done, and bring it into the half-year's account, which he believed was the more correct principle to act upon. Considering how short a time the company had been in operation, that they were exposed to sharp competition, and that they had had to make extensive alterations in the works, he thought the shareholders would agree with him that the anticipations indulged in at the outset of the undertaking had been fully justified. The returns for the past six months were something like £500 more than for the whole of last year, which was in itself a gratifying feature, and accounted for the necessarily large increase in the amount of plant and stock. The returns were increasing; yesterday only they had another large gas company added to their list of customers. In the profit and loss account, the sum of £445. 9s. had been written off for depreciation of patents, and £705. 2s. 4d., a moiety of the preliminary expenses, thus extending the period of their payment over three years from the commencement of their business. After providing for the payment of a dividend, at the rate of 7 per cent., they were enabled to carry over a balance of £533 7s. 1d. to the next half year. He hoped the meeting would agree with him in looking upon this state of things as highly satisfactory.

Mr. KING objected to the introduction of the £550, the value of the forfeited shares, into the profit and loss account, and expressed his doubt whether it was at all a proper mode of dealing with that item.

Mr. METCALFE endorsed the opinion of the last speaker on this point, and said he considered the sum in question should be deducted from the amount paid for the goodwill of the business.

Mr. HICKS said he thought the shareholders ought to have had before them an account showing the total sums received and expended in the trading operations of the company during the half year, and not merely a statement of the profit made.

Mr. ROWSELL thought it would scarcely be prudent to publish such an account. But the shareholders could obtain that information for themselves at the office of the company, and he, as one of the auditors, would be happy to go through the books with them and show how the profits had arisen.

Mr. KING, referring again to the item of forfeited shares, moved as an amendment to the motion for the adoption of the report—"That the shares now declared to be forfeited be transferred from the credit of the half year's profit and loss account to a suspense account, and that the balance then remaining be carried forward."

Mr. HICKS seconded the amendment. The company would still be able to pay the dividend recommended in the report, and carry forward a balance. This was the only item in the accounts which struck him as objectionable.

The CHAIRMAN doubted whether this really was an amendment. The sum carried forward, whether regarded as the value of the forfeited shares or as a suspense account, was very much the same.

Mr. ROWSELL said if the amendment were adopted he should move that the moiety of preliminary expenses written off be carried back to capital account. If they debited themselves with the one amount they ought to take credit for the other.

The CHAIRMAN, after some further conversation had taken place upon the subject, said there could be no doubt the £550 belonged to the proprietors to dispose of as they pleased. The accountant who had prepared the accounts had placed the item where it now appeared, and the directors felt fully justified in sanctioning it. It was in the option of the shareholders to adopt the amendment, but he did not recommend that course. With reference to the publication of a trading account, he very much questioned the policy of such a course; and it was the less necessary because every shareholder was at liberty to go through the books of the company with the manager and ascertain the facts for himself.

The amendment was then put, and negatived, the mover and seconder alone voting for its adoption.

Mr. WILLIAMS suggested a further amendment, which, however, was not seconded, to the effect that the £550 should be struck out of the profit and loss account, and that the amount written off for preliminary expenses should be reduced from £705 to £600. This would still enable them to pay the dividend recommended by the board, only that they would carry forward a smaller balance.

The motion for the adoption of the report was then put, and carried unanimously.

The CHAIRMAN said, in anticipation of such a result, the directors had had the warrants prepared, so that the shareholders might receive their dividends before leaving the meeting.

On the motion of Mr. PAXON, seconded by Mr. BRIGHTON, it was resolved that the remuneration of the auditors be seven guineas each for the half year.

The CHAIRMAN, in reply to Mr. Benson and other shareholders, repeated the statements contained in the report as to the business in Germany which the directors had undertaken to make a trial of.

Mr. KING inquired the reason of the apparent discrepancy in the statement of the capital. In the balance-sheet the amount called up appeared to be £15,883; whereas, in the profit and loss account, the capital upon which dividend would be paid was only £12,672.

The CHAIRMAN explained that the difference arose from the fact that no dividend was payable upon the shares allotted to the vendors as part payment for the purchase of the business until two years after the other shares had received dividends.

On the motion of Mr. BENSON, seconded by Mr. OAKLEY, a very cordial vote of thanks was given to the chairman and directors for their services.

The CHAIRMAN acknowledged the vote. He said the directors were much obliged for this expression of the approval of the shareholders. They had had rather an uphill journey hitherto, but he hoped they had now obtained a good position with the gas companies. They had every confidence in the undertaking, first-class workmen being employed, their business well looked after by the officials of the company, and believing in the testimony of the ablest judges that they were in possession of valuable patents. He regarded the accounts as now presented to be very satisfactory, and he had every reason to hope they would go on improving.

COMMERCIAL GAS COMPANY OF IRELAND, LIMITED.

The Second Ordinary General Meeting of this Company was held on Tuesday, August 1, at their Offices, 22, Westmoreland Street, Dublin—JAMES PIM, Esq., in the chair.

The SECRETARY (Mr. Wigham) read the notice calling the meeting, and the proceedings of the last general meeting, and then proceeded to read the statement of accounts and report of the directors.

The following is the directors report:—

Soon after the general meeting, at which your directors last report was adopted, notices appeared in the public prints of the intention of the Hibernian Gas Company to seek for statutory powers over the district proposed to be lighted by this company. Such an Act, if obtained, would have presented an almost insurmountable obstacle to the success of this company at Kingstown. Your directors were therefore compelled, in order to protect the interests, to issue similar notices; and after consulting with the members to proceed also to seek parliamentary aid, two bills were accordingly promoted, and were received by the public of Dublin and Kingstown with the most unmistakeable satisfaction. Petitions were numerously signed in their favour, and deputations of your directors were most cordially received, and promised support not only by most of the large consumers of gas, but by the Municipal Council of Dublin and the Town Commissioners of Kingstown. This manifestation of feeling in their favour culminated in a great public meeting called by the lord mayor, upon the requisition of 600 of the leading citizens of Dublin. The valuable information given by Sir John Gray and others at that meeting, resulted in a unanimous resolution to support this company.

Unfortunately, owing to some informalities, the bills of this company were rejected on Standing Orders, and the whole energy of the board was then turned to defeat the measure introduced by your opponents, the Hibernian Gas Company. The result is known to you all. After a patient investigation, the bills of the Hibernian Gas Company were thrown out on their own demerits, and thus both parties are now equal as regards parliamentary powers.

Your directors cannot but avail themselves of this opportunity to return their thanks to the committee and officers of the corporation of Dublin, whose cordial co-operation materially contributed to defeat a bill, which, if passed, they, as well as your directors, felt would have tended to perpetuate the present gas monopoly which bears so heavily on this city.

The following document on this subject was issued by the directors on the 27th of February:—

"*Commercial Gas Company of Ireland, Limited,*
"*Offices, 22, Westmoreland Street, Dublin, Feb. 27, 1865.*

"The directors beg to inform the shareholders of this company that, in compliance with the almost unanimous requisition received from them, they brought before the present Parliament two bills—one for the gas lighting of Dublin and its suburbs, the other for Kingstown and its adjoining districts; but, owing to the non-compliance with certain technical formalities required by the House, the bills have been rejected on Standing Orders, and no opportunity has been afforded for testing their merits. The directors will, therefore, be unable to proceed further with them this session; but from the assurances of support they receive on all hands, and the unmistakeable public approbation with which their determination to supply better gas at a cheaper proportionate rate has been regarded, and from the amount of pecuniary support which is promised to them, they have determined (keeping steadily in view that which is their first care—the interests of the shareholders) to introduce more fully matured bills next session of Parliament. They have been confirmed in this determination by the daily-repeated and increasing expression of opinion which reaches them that the gas consuming public of Dublin and Kingstown are determined to have purer gas of a higher illuminating power, and, therefore, cheaper in proportion to the light given, and that such supply of gas they wish to have from a *local* company, rather than from one, the directors of which reside in London.

"Remembering that it was that feeling which, to a large extent, called the Commercial Gas Company into existence, the directors see less reason to regret the delay which has arisen, because it will confer additional benefit upon the company, by giving time for the further development of that sentiment on the part of the public of Dublin and Kingstown, and it will also enable the directors so deliberately to mature the new bills as to meet all the requirements of the public, and to push them forward with the utmost vigour and perseverance.

"JOHN R. WIGHAM, Secretary."

In accordance with the intention above expressed your directors propose to apply next session of Parliament for the necessary powers, and have secured a suitable plot of ground for the gas-works. The almost unanimous desire on the part of the public for 20-candle gas induces the directors to adopt that quality as the basis of their new bills, and in this they believe they have the full concurrence of the members of the company, not only on public grounds, but because from the last engineering evidence it appears that the supply of such gas is likely to be highly profitable. It is now proposed immediately to proceed with the works at Kingstown, so as to be able to fulfil the contract with the commissioners of Kingstown for lighting the public lamps of that township by next winter.

By the statement of accounts submitted herewith it will be seen that the expenditure has largely exceeded the income. This is chiefly caused by the legal expenses rendered necessary by the course adopted by the Hibernian Gas Company. Your directors regret that these expenses should have been so much greater than was at first anticipated, but after full investigation they do not consider that, although heavy, the outlay is more than is warranted by the circumstances of the case. They may remark that, although by the Articles of Association they are entitled to a considerable sum for their services in promoting the company, they have not appropriated to themselves anything on that accounnt, and have no intention of doing so until the company may be in a position to afford it.

The directors, with the full expectation of obtaining parliamentary aid this session, look forward confidently to present a more favourable statement on the next occasion upon which they have the pleasure of meeting the members of the company.

Mr. Collis and Mr. Stokes having resigned their position as directors of your company, the valuable services of Sir John Gray, M.P., and Mr. C. G. Malone, formerly a director of the Dundrum Gas Company, have been secured to fill their places. This appointment will, no doubt, receive the unanimous approbation of the members of the company.

The directors who retire according to Act of Parliament are the Right Honourable the Lord Mayor, Sir John Gray, M.P., and C. G. Malone, Esq.; they are eligible, and offer themselves for re-election.

In accordance with the decision of last general meeting, your directors have given some attention to the gas supply of provincial towns in Ireland. They have entered into correspondence with several towns, and are confirmed in the opinion expressed in their last report—that much profitable business may be done in the lighting of such towns. They have not as yet, however, concluded upon any purchase except that of the Dundrum Gas-Works, which, on the 24th of January, of this year, they bought from the Dundrum Gas Company, Limited, and have now in full operation.

Your directors determined to take this step, chiefly because, owing to the obstacles thrown in the way of their progress at Kingstown, the commencement of the erection of gas-works for that township was unavoidably delayed, and they were anxious, without waiting till these obstacles were removed, to commence operations in the neighbourhood of this city, with which most of the members are connected. They, therefore, determined, after mature deliberation, and on the recommendation of Mr. Anderson, their engineer, to attempt to obtain possession of the gas-works by which the suburban districts of Dundrum and Roebuck are lighted. Accordingly negotiations were opened with the directors of the Dundrum Gas Company, Limited, which resulted in the purchase by this company, upon favourable terms, of all the gas-works, buildings, main-pipes, service-pipes, cocks, and meters now in use, for lighting that locality.

The mains in connexion with the gas-works thus acquired are laid for many miles through a wealthy and rising district, and are within a very short distance of the Alliance Gas Company's pipes from Dublin Gas-Works on one side, and the Hibernian Gas Company's pipes from Kingstown Gas-Works on the other. The directors, therefore, congratulate the members upon this acquisition of the goodwill of a ready-made gas concern in full working order, which, though at present not large, is capable of much development, and when the company's operations at Kingstown are sufficiently advanced, is calculated to be a most useful auxiliary. There is no doubt that the gas-works of the company at Dundrum will yield a steady and permanent profit on the money invested in them.

The CHAIRMAN, in rising to move the adoption of the report of the directors, gave a short history of the operations of the company. He alluded to the delay which has arisen in the erection of the works at Kingstown, and, while regretting that it had occurred, considered that the directors had only acted with common prudence in not hastily spending the company's money while the Hibernian Gas Company were seeking for their bill. On the rejection of that bill by the committee of the House of Lords, the directors at once accepted contracts for the works at Kingstown. He expected in a very short time to see the contractors at work there. He alluded also to the purchase by the company of the Dundrum Gas-Works, as favourably situated for future extensions, and as yielding a steady profit of 6 per cent. Besides which, the possession of those works gave the company a *locus standi* in Parliament which had been of much importance to them. The chairman further entered into the subject of the gas lighting of the city of Dublin, and stated the determination of the directors, if supported by the shareholders, to persevere in their intentions to seek a bill for lighting Dublin. He said it would be wrong in them to neglect the loud call that had been made upon them in that matter. He did not allude only to the meeting at the Commercial Buildings, influential as that meeting undoubtedly was, but to the assurance of pecuniary support which they had met with on all hands. One gentleman told him that he would provide £50,000 towards the funds of the company if it proceeded and got its bill for lighting Dublin. That gentleman did not stand alone, and there were very many others ready to subscribe the necessary capital. The chairman concluded by moving the adoption of the report and statement of accounts.

Mr. JAMES MILO BURKE, J.P., seconded the resolution. He called the attention of the meeting to the way in which the so-called Hibernian Gas Company had acted, and the useless expense it had entailed upon the Commercial Company. Instead of meeting them in the open market, and contending with them like parties not ashamed of the commodities they had to sell, they rushed to Parliament to give them for Kingstown the same monopoly which is so banefully exercised in Dublin. Of course, the directors of the Commercial Company were compelled to oppose these proceedings. They consequently promoted two bills of their own, which, unfortunately, were thrown out. He would tell them those bills were thrown out by the merest quibble, a very slight omission having been insisted on by the opposing parties being the ground of their rejection. The directors then gave their most strenuous opposition to the bill of the United General or Hibernian Company, in which, as stated in the report, they were successful. The directors had certainly expected that the bill of their opponents would have been very formidable; they believed they were a powerful company composed of English capitalists which had fattened themselves upon the money taken out of Irish pockets, and were in a highly prosperous condition, but when they came to investigate their bill, they discovered that the affairs of the redoubtable Hibernian Company were in such a state that the Committee of the House of Lords threw out the bill on the showing of their own witnesses. Mr. J. M. Burke proceeded to say that he did not believe the Hibernian Company could ever obtain a bill, so much of their capital having been completely lost. No committee of either House would ever permit Dublin to be saddled with a company having such a mass of misspent capital.

Mr. A. H. BAGOT said, before the chairman put the resolution, he wished to make an observation. He hoped that in future the directors would present the accounts, and have them in the hands of the members for a reasonable time before the meeting, so that they might be scrutinized fully by each member. He did not say this in any fault-finding spirit, but it was usual with other companies, and would, he thought, be an advantage. With regard to the report which had just been read, he begged to say that he considered it highly satisfactory. A thousand pounds or two were not much to be regarded when the company had such important objects in view. He was well satisfied with the progress of the company so far, and hoped that the same energy and perseverance which had brought it to its present position would be continued till the company were supplying the city with good gas. He remarked on the manifest advantage of having such a company under local management, from whom we might expect good light, civility, and personal attention, and whose officers would be on the spot.

The CHAIRMAN replied that it was quite the intention of the directors to publish the statement of accounts in future, but as there were so *few* transactions up to this time it was not considered necessary. He would observe that, in addition to the revenue from the works at Dundrum, there was one item of nearly £500 for interest; so that the shareholders will see their money was not wholly lying idle.

The resolution was then put from the chair, and carried unanimously.

Mr. JAMES STIRLING moved the second resolution—"That the Right Hon. the Lord Mayor, Sir John Gray, M.P., and Charles G. Malone, Esq., be elected directors of the company."

It was seconded by Mr. R. MOLLOY, and carried unanimously.

Mr. RICHARD ALLEN moved the next resolution, viz.:—"That we hereby sanction those proceedings which have been already taken by the board in Parliament; and we hereby authorize the board to apply for such Acts of Parliament as may be considered expedient, and to insert such clauses therein as they may deem necessary to increase the powers and capital of the company. And we also empower them to purchase or acquire the business or any part of the business or property of the existing companies, or either of them, upon such terms as may be deemed expedient, or to make such other arrangement with them as the board may deem advisable." He felt great pleasure in moving this resolution, and hoped the directors would not be satisfied with merely lighting Dundrum, Kingstown, and other provincial towns, but would at once renew their exertions to light the metropolis. He felt very strongly on the subject, as the gas which is at present supplied is both inferior in quality and injurious to health. He had very great confidence in their directors, and he might be permitted to add he also had great confidence in the secretary. He knew him, perhaps, better than some others, and he believed him to be the right man in the right place. He hoped that both directors and secretary would continue to conduct the affairs of the company with the same attention as heretofore, and he, for one, would gladly stand by them till they had got their bill for lighting Dublin. The resolution had his cordial approval.

The resolution was seconded by Mr. WILLIAM CROWE, and carried unanimously.

Mr. BURKE then asked Mr. Pim to leave the chair, and moved the Lord Mayor thereto.

Mr. PIM, before doing so, said he was much pleased with the unanimous manner in which the last resolution had been received, and was sure that the confidence which was thus shown in the directors would encourage them to continue their labours till they had brought them to a successful issue.

The LORD MAYOR having then taken the chair,

It was moved by Mr. BURKE, seconded by Mr. BAGOT, and resolved—"That the thanks of this meeting are due, and are hereby given to Mr. Pim for his dignified conduct in the chair."

The LORD MAYOR, in putting the resolution, stated the satisfaction which he, as a director, felt at the cordial way in which the proprietors of the company had met them. He regretted that they had no dividend to offer, but he hoped that on the next occasion they would be in a better position, and if they had not then a dividend to offer, they might, at all events, see one looming in the distance.

The meeting then separated.

METROPOLITAN BOARD OF WORKS.

FRIDAY, JULY 28.

The usual Weekly Meeting of the Board was held this day—Sir JOHN THWAITES in the chair.

THE USE OF SUBWAYS.

The St. Saviour's District Board having applied to this board to compel the gas and water companies to lay down their mains in the subway in Southwark Street, the Streets Committee, to whom that application was referred, now brought up their report thereon, recommending that a communication be addressed to the St. Saviour's District Board of Works, to the effect that this board have no power to compel the gas or water companies to lay down their mains in such subway.

On the motion to agree with the committee in their report,

Mr. BRUSHFIELD suggested that a scale of charges should be laid down for those gas and water companies who might be desirous to lay their pipes in the subways, as it was most desirable to prevent the frequent breaking up of the surface of the streets.

Mr. NEWTON said he did not see that any useful purpose would be answered by fixing upon any scale of charges, inasmuch as the gas and water companies had combined together to prevent the board from obtaining parliamentary powers to compel those companies to use the subways when they were so formed, and that combination had been successful in defeating the bill, which was introduced by the board for the purpose.

Mr. FREEMAN concurred with Mr. Newton in thinking it was useless to fix upon a scale of prices, as the gas and water companies had opposed the board at every step in their efforts to obtain powers to compel them to lay their mains in the subways. Until Parliament saw fit to give those powers to the board, the question must rest as it did at present.

The report was then agreed to.

THE NUISANCES AT BARKING AND CROSSNESS OUTFALL SEWERS.

The CLERK read the following letter from the Marquis of Hartington, Under-Secretary of State for War, with reference to certain nuisances experienced at the Royal Arsenal, Woolwich:—

War Office, July 21, 1865.

Sir,—I am directed by the Secretary of State for War to acquaint you, for the information of the Metropolitan Board of Works, that representations have been received from the officers of the departments in the Royal Arsenal, Woolwich, complaining of the nuisance arising from certain premises on the banks of the Thames, below Woolwich, in which some offensive manufactures are carried on. A large factory situated near the mouth of Barking Creek, on its eastern bank, has been more particularly mentioned, and Lord De Grey has been assured that, with a certain wind, the stench from these premises is almost unbearable in all parts of the Royal Arsenal. His lordship hopes the Metropolitan Board of Works may be able to take some steps to abate so great a nuisance.

I am also desired to direct your attention to the fact that the sewage of the district of Plumstead is allowed to diffuse itself throughout the open ditches on Plumstead Marshes, situated near the eastern boundary of the Royal Arsenal, although to do so it actually crosses over the main outlet sewer of the metropolitan general drainage. This, also, becomes an intolerable nuisance to the workmen and others employed in the Royal Arsenal; and the medical officer of this department in the Royal Arsenal having represented that the offensive odours are injurious to health, the subject deserves the immediate attention of the Metropolitan Board of Works. A communication on this subject has been addressed to the Local Board of Health.

(Signed) HARTINGTON.

To the Chairman, &c.

Upon this letter Mr. Bazalgette presented the following report:—

Engineer's Department, Spring Gardens, July 25, 1865.

The manufactory more particularly referred to in this letter is that of Mr. Lawes, near to the mouth of Barking Creek, and on its eastern bank. Its principal manufacture is superphosphate of lime, and the nuisance arising from it and the other manufactories in this neighbourhood on both sides of the river, were fully reported upon jointly by Dr. Letheby and myself to the board, who, on the 19th of May last, referred the matter to the Main Drainage Committee to consider the steps it might be advisable to take in the matter, and that committee, upon such reference, have directed their solicitor to obtain the opinion of Mr. Giffard, Q.C., as to the best means to be taken for abating the nuisance. As that abatement is what the Secretary of State for War asks of this board, I recommend that this portion of his letter be referred to the committee in connexion with the former reference.

With respect to the complaint of the sewage of the Plumstead district being allowed to disperse itself through the open marshes—although to do so it has to cross the southern outfall sewer—the Marquis of Hartington states that a communication has been addressed to the local board on this subject, but as the attention of this board is also asked to the matter, I recommend that a copy of so much of the letter as relates to this complaint be sent to the Plumstead district board.

(Signed) J. W. BAZALGETTE.

The report was received, and on the motion of Mr. Phillips the former report of Dr. Letheby and Mr. Bazalgette was ordered to be transmitted to the Marquis of Hartington.

NETHERLANDS-INDIA GAS COMPANY.

At the First General Meeting of the Shareholders of this Company, held at Rotterdam, on Wednesday, July 19, the report of the directors, approved by the commissioners, was presented. From that report we glean the following information relative to the position and prospects of the company.

The company was established in the latter part of 1863, and its Act of Incorporation was granted on the 10th of December in that year. By the terms of arrangement with the concessionists, the works, with all pertaining to them, were handed over to the company on the 1st of January, 1864, their agent, Mr. Botermans, having been sent out to Batavia previously, for the purpose of taking charge of the same.

The company was formed not merely for the purpose of carrying on the works at Batavia, which had then been in operation a short time, but with the object of obtaining concessions to light Soerabaya and Samarang, for which the first concessionists had been directed by the Netherlands-Indian Government, on the 29th of September, 1863, to send in tenders. With this end in view the directors and commissioners deemed it advisable to send out to India a representative competent to conduct the necessary negotiations, and also to regulate the establishment at Batavia upon a broad and comprehensive scale. The directors are happy to report that they have found in the representative chosen, Mr. R. A. Kerkhoven, already favourably known in several important situations, a gentleman thoroughly competent to this important task, and with whom they could safely entrust the interests of the company. They entertain no doubt as to the manner in which such an establishment ought to be conducted, and their decision on this point has been confirmed by the unanimous support of the commissioners and the opinion of one of the first engineers of the country.

It is in a largely increasing consumption that the profits of gas-works are to be sought. Indian peculiarities, relating both to locality and the customs of the inhabitants, require to be taken into consideration. Residences are situated at a comparatively large distance from each other, and many Europeans sojourning in India for a limited period only decline to incur the heavy cost of laying on gas to their houses. This objection has been met by the directors undertaking to provide the necessary services and to charge a rent for the same—an arrangement which has given general satisfaction, and resulted in a palpable appreciation of the company's endeavours to meet the public requirements. The consequence of this measure is that more capital has been absorbed; but the directors believe that the business will in the course of a few years repay the outlay.

Nothing has been neglected which might tend to prevent any cause of complaint, and the consumers have been requested by circular to communicate to the company should any such arise. Apparatus for testing the quality and illuminating power of the gas has been sent out, and also an experimental meter stamped by the authorities in Great Britain, with which, when desired, the accuracy of any consumer's meter may by determined in his presence. The large supply of fittings sent out is justified by the continuous demand. Equally justified is the sending of two engineers and seven able fitters, for not only has it been found that there was sufficient employment for them in consequence of the increasing consumption, but the rapid extension of the works has met with general approbation, while the addition to the company's staff has prepared the way for an enlargement of the sphere of their operations beyond the limits of Batavia.

Mr. Botermans returned to Europe in the middle of May, having performed his arduous task (in which he was ably assisted by Mr. Praeger, the director of the works at Batavia) most satisfactorily, and with the most gratifying results.

The works at Batavia are situated in the Gang Ketapang, the river Kroekoet running along the grounds on its passage to the roads. The land upon which the works are erected, is 370 yards in length, by about 109 yards in breadth, in addition to which the company have the right of building over about 255 yards by 86. . On the 1st of January, 1864, the canalization of the principal districts, streets, and suburbs of Batavia, covered about 27 miles. The works at that time consisted of a retort-house, built of iron and stone, and containing 12 beds, each of five retorts, condenser, purifying-house, two pumps with steam-engines, two coke-houses, scrubber, four lime-pits, a gasholder of the capacity of 77,000 cubic feet, while the building of a second of like dimensions was far advanced; a work-shop with forge, hydraulic press for testing gas-pipes, and machine for trial of meters; extensive coal-sheds, iron-roofed and tiled; tar pit; offices, extensive warehouses for lamps, ornaments, and fittings; a residence for the engineer, and tenements for native labourers. The above-mentioned buildings and apparatus, as well as the factory chimney, were all, according to the report of the manager, in a sound and satisfactory condition.

During the past year the roof over part of the coal-sheds, condenser, exhauster-house, and forge, has been lengthened; the second gasholder has been completed, and is now in working order; a second condenser and scrubber have been put up; the lamp warehouse has been enlarged, and two new buildings erected for warehousing materials.

It is proposed in the present year to lengthen the retort-house sufficiently to receive 12 more beds of five retorts each, to erect a building for the testing of meters, an experimental retort-house, and some new dwellings for the labourers on the works.

The directors report satisfactorily respecting the Europeans employed, complete harmony existing among them. There have been some changes among the native labourers, though many have been on the works ever since their establishment, and under reasonable and mild treatment it is

found that they perform all the duties required of them. Every endeavour is made to qualify them for the work, and to encourage them by increasing their wages, the favourable results of which the directors have already been able to observe.

The progress of the company's business may be judged of from the fact that whereas on the 1st of January, 1864, the number of lights in private houses (besides the street lamps and Government buildings) amounted to 1548, at the end of December last they amounted to 4545, showing an increase of 2997. This immense increase was chiefly observable in the latter months of the past year, when the additional hands and the augmentation of materials facilitated a vigorous carrying on of the company's affairs.

The Government subsidy for the lighting of the streets for the year 1864 was paid without any deduction of fines. Tar has met with a ready sale at market prices, and there has been a growing demand for coke, especially for manufactories.

An examination of the company's mains shows that there has been no greater oxidation than is met with in Europe, while the loss of gas by leakage amounts only to 15 or 16 per cent., which, with such an extensive canalization, is very moderate, and will be further diminished with an increased consumption.

With respect to the prospects of the undertaking, it is highly satisfactory to be able to state that the number of private lights, which in December, 1864, amounted to 4545, continues to increase, and at the end of May last amounted in number to 6057. Comparing the month of March, 1865, with that of December, 1864, there was a surplus receipt at the latter period for private consumption of about 17 per cent., or, in comparison with the average receipts of 1864, an increase of about 60 per cent., while the demand for gas continues regular, and keeps pace with the growing capabilities of the company.

In addition to the numerous private residences still to be lighted, the negotiations for lighting the large Chinese camp are in an advanced state; and the agreement with the Government for lighting the barracks, hospitals, &c., as well as for extending the mains beyond Meester Cornelis, is all but concluded. The negotiations with the Government for supplying Soerabaya and Samarang with gas are also being energetically carried on by Mr. Kerkhoven.

The result of their operations enables the directors to declare a dividend of 12·50 fl. per share—say 5 per cent. on the paid-up capital; and after writing off a sum, in accordance with Article 40 of the Statutes, for depreciation, there remains 20,000 fl. as a reserve.

The directors remark that though a dividend of 5 per cent. in such an undertaking may be deemed satisfactory, yet, taking into consideration the period of furnishing the capital, the dividend really amounts to 5½ per cent.; that while the profits of the company only began on the 1st of January, 1864, the expenses began from the date of the establishment of the company, and consequently extend over a period of fourteen months; and that notwithstanding the heavy expenses incurred at the commencement of such an enterprise, and which will not again be necessitated, the whole of those expenses have been written off.

In conclusion, the directors say they feel justified in asserting that the company have every reason to expect a continued improvement in the state of their affairs; and they trust that the results already obtained, and the promising prospects to which they have adverted, may be regarded as not only fully answering the expectations of the directors and commissioners, but also those of the shareholders.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
1900	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	5 0 0	5 5 0
10000	5	Do., second issue	3 0 0	5 0 0	3 to 3⅛
10000	5	Do., third issue .	1 0 0	5 0 0	1¼ to 1½
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29¼ to 30
8200	20	Do., new . . . . (Norwich, Huntsculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	78¾ to 79¼
6000	50	Do.	30 0 0	10 0 0	48 to 48½
10000	20	*C. of London*, A sh.	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7¼ to 7⅜
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15⅛
35000	25	City of Moscow (L) Colonial & General	5 0 0	7 0 0	2¼ to 3
17490	25	*Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13 10 0
12000	10	Do., new shares.	5 0 0	10 0 0	6 15 0
		(Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)			
20000	10	*Great Central Gas Consumers* . .	10 0 0	10 0 0	16 5 0
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	83 0 0
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian .	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	93 0 0
3000	40	*Independent* . . .	40 0 0	10 0 0	71 to 73
3000	10	Do.	10 0 0	5 0 0	8 10 0
3000	20	Do.	7 0 0	7 10 0	9 0 0
6886	50	*London*	50 0 0	10 0 0	79 10 0
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781 *l*		Do., 1st pref. sk		6 0 0	
11828 *l*		Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	2 10 0	
150000	1	Oriental, Calcutta	1 0 0	8 0 0	1¼ to 1⅛
16000	5	Ottoman (Limited)	5 0 0		4 to 4¼
10000	10	Pará (Limited) . .	10 0 0	5 0 0	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	33½ to 33¾
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
		Rio de Janeiro (L.)			
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference .	5 0 0	7 10 0	
		Shanghai			
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15 15 0
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35 5 0
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited. A shares.	10 0 0	10 0 0	16⅞ to 16¾
10000	10	Do., B shares.	5 0 0	10 0 0	8 10 0
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ⅜ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 3-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Pelling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 —

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s. 6d
Cork	9s. 0d. to 9 6
Dover, Folkestone, and Ramsgate	6 6
Dublin	9s. 6d. to 10 0
Exeter Quay	8 6
Ipswich	5 9
London (from Leith)	8 6
London (Pool)	6 3
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7 3
Plymouth	7 9
Shoreham	6 6
Whitstable	5 9
Weymouth	7 6

Foreign.—Per Keel:—

Barcelona	£24 0
Bordeaux	15 0
Boulogne and Calais	£7. 10s. to 8 0
Cadiz	17 0
Copenhagen	£8. 10s. to 9 0
Genoa	22 5
Hamburg	£8. 5s. to 8 10
Havre de Grace	£9 to 9 5
Leghorn	22 10
Lisbon	16 0
Rotterdam	8 0
Stettin	10 10
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000	2 15 6
Ingham's ditto (at Wortley), p. 1000	2 15 0
Fire-clay Retorts, p. ft. run	9s. 6d. to 0 7 0
Tough Cake Copper, p. ton	86 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (ex London), p. ton	7 15 0
Foreign Spelter, p. ton	22 2 6
English Block Tin, p. ton	94 0 0
Banca, p. ton	94 10 0
Tarred Rope Yarn, p. cwt.	1 0 0

CONTENTS.

Notes upon Passing Events:— PAGE

The Disputes at the Great Eastern Railway Board 625
The Cattle Disease and the Farmers 625
The *Times* and the Patent Laws 626
The State of the Upper Thames 627
Report of Mr. Quick on the Constant Water-Service Supply in London 628
The New Water-Works for the Supply of Paris 628
Unfounded Charge of Plagiarism by the *Builder* against the Designs for the International Exhibition of 1867 628

Circular to Gas Companies:—

The Metropolitan Gas Accounts for 1864 628
Charge of Fraud against an Association for the Inspection of Gas-Meters 629
Depressed State of the Shares of the Perth New Gas Company . . 629
Proposed Application of the Emanations from Gas Purifiers to the Cure of Diseases of the Organs of Respiration 629

Communicated Articles:—

Proposed Application of the Emanations from Gas Purifiers to the Cure of Diseases of the Organs of Respiration 632
On Ventilation, by General Morin 632

Register of New Patents:—

Noble, F.—Machinery for Raising and Applying Water 633
Watson, J.—Manufacture of Hydrocarbons 633
Cassell, J.—Carburation of Gas and Atmospheric Air 634
Clavel, A.—Holders for Glasses, Shades, and Reflectors 634
Bateman and Garrard—Pumps 634
Taylor, E. H.—Drawing off or Emptying Casks containing Petroleum, &c. 634
Clark, W.—Rotary Engines 634
Cormack, W.—Distillation of Matters capable of yielding Hydrocarbons 634
Rydill, G.—Hydraulic Engine and Pump 635
Solomon and Grant—Lamps for burning Magnesium and other Metallic Substances 635
Roger, P. A.—Apparatus for Preventing the Extinction of Lamps . . 635
Schwartz, J.—Apparatus for Lighting Rooms and Buildings . . . 635
Cutler, J.—Overflow or Waste-Pipes of Cisterns 635
Yates, F.—Apparatus for Generating Combustible Gases 635
Gwynne, H. A.—Centrifugal Pumps 635
Thrift, W.—Rotary Engine, Pump, or Blast 636
Slack, J.—Filters and Filtering Apparatus 636
Applications for Letters Patent 636
Grants of Provisional Protection 636
Notices to Proceed 636
Patents which have become Void 636

Legal Intelligence:—

Southwark Police Court 636

Miscellaneous News:—

Sanitary Improvements at Woolwich 636
Association of Gas Managers for the Counties of Fife, Kinross, Perth, and Forfar 637
Dr. Whitmore's Report on the Quality of the Water supplied in St. Marylebone, in July, 1865 639
Dr. Whitmore's Report on the Quality of the Gas supplied in St. Marylebone, in July, 1865 639
New Gas and Water Company at Cowpen Quay, Blyth 639
Coal Statistics of the United Kingdom 639
Portuguese International Exhibition 639

Share List of Metropolitan Gas Companies 640

Price Current 640

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

R. J., Accrington.—*The "rack-rent" of a dwelling-house is the rent at which it is let to a tenant, or that could be obtained for it from a tenant when it is occupied by the owner.*

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, September 5, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, AUGUST 22, 1865.

Notes upon Passing Events.

At this dull season, when the theatres which are not closed reserve their novelties for the winter season, that portion of the public which does not hold shares must be very much obliged for the amusement afforded and to be afforded by the quarrels of the Great Eastern Railway directors. Whether, in consequence, the shareholders in that unfortunate undertaking will get their own, in the shape of an increased dividend, may be doubted; but at any rate, when Colonel Jervis and Mr. George Parker Bidder fall out, their constituents may expect to hear some truths told in very plain language. Colonel Jervis gave the Harwichians a taste of his quality on the hustings. When Mr. Stephen, a barrister, suggested that the colonel was disqualified for a member of Parliament because he held a paid appointment under Government, the Great Eastern victim could find no better answer than to call his rival's statement "a lie." It is this hot and hard-mouthed gentleman who complains that he has not been treated with courtesy by the Great Eastern board. When, however, we remember that Mr. Bidder is the intellectual chief of that board, and call to mind the choice flowers of eloquence with which this eminent engineer is in the habit of seasoning his public and private discourse, especially when crossed in any pet project, we cannot help believing that the colonel has met his match, in words at any rate. Surely two such Arcadians never met before at the same board—two such bull terriers were never matched in the same pit. According to all past experience, the next general meeting ought to be as rich and rare a treat as an old-fashioned bull-bait or modern badger drawing. It is, however, to be feared that prudent counsels will prevail, and the public lose the fun without the shareholders getting any money. As to the merits of the case, it is extremely difficult to distinguish between the military pot and the civil engineer kettle. Colonel Jarvis was discreetly dumb as long as the company's money was lavished in securing his seat for Harwich. But as to the charges of exceeding borrowing powers, of making a curious bargain for the Wensum Valley line, and a still more curious bargain with contractors, why, not to put too fine a point upon it, "these "things look fishy, after the company's explanations." We wait with curiosity the result of the general meeting.

The cattle plague continues to be the most prominent subject of interest. Meetings of farmers, graziers, milkmen, and butchers, are held daily in all parts of the country. Milk in London has been raised to 5d. a quart, and it may be expected that before winter the price of meat will be something over a shilling a pound all round. In the meantime the origin and the remedy for this destructive disease are alike unknown. The two professors, Simonds and Gamgee, who have declared themselves of opinion that the plague is of Russian origin, find their views supported by acclamation, but without any facts, at all meetings of graziers. On the other hand, the butchers and cattle salesmen are just as unanimous in declaring that this murrain has arisen spontaneously; and although they labour under the difficulty of having to prove a negative, so far they seem to have the best of the discussion. The *Times* of the 15th contains a letter from a name well known in the meat trade—Mr. John Giblett, who, born a butcher and bred a salesman, has long been one of the principal cattle-brokers in the Metropolitan Market. Mr. Giblett's opinions on a veterinary question are not abstractedly of any more value than those of a monthly nurse on a case of cholera, and his right hand appears to be much more apt at handling an ash-stick than a pen. He hides what he really has to say under a cloud of words; but he states the following facts that it will be difficult for the most ingenious professor to make agree with the foreign infection theory. First, the Jews—whose choice of meat is part of their religion, who eat of no beast that has not been examined and *sealed* by a

priest—consume foreign oxen almost exclusively, in preference to English, Irish, or Scotch. Secondly, all the beasts supplied to the Government under contract for the army are subjected to two very rigorous official inspections. They may be old, they may be tough, but they must be sound and sweet to look upon. Six hundred head a week are required throughout the year to fulfil these contracts; eighty per cent. of them are foreigners. Thirdly, the weekly importation of foreign beasts averages 5000 head. Within the last three weeks 3800 were brought for sale on one Monday's market, and yet out of this vast number the Government inspectors, assisted by several professional gentlemen of Mr. Gamgee's school, were unable to detect one case of the Russian disease, or *Rigsderfest*, and were only able to condemn three dull animals to be slaughtered by way of precaution. The simultaneous breaking out of the disease in all parts of the country at once, and the especial prevalence of it amongst dairy stock, confirm the sad theory that it is an outbreak like the influenza, thirty years ago, or the cholera, generated by some atmospheric influence. The loss of capital will be enormous. The indirect advantage will be improved care of stock in the passage-boats, in the yards of the feeder, and stables of the dairyman.

A case has come within our knowledge that bears out the atmospheric theory. A grazier, ninety miles from London, had twenty-five bullocks feeding on the same pasture; they had been without contact with other animals since last October. On the 28th ult. they were perfectly well, the next day (a Saturday), they were observed to fall off in their feeding, and on Monday eight were dead. Thereupon all the rest were slaughtered to save their value. The symptoms of those that died resembled the published accounts of the London cow disease. We do not say that contact was impossible, but it was in the highest degree improbable in this instance. It would be much more satisfactory to believe that this new cattle disease was of foreign origin, because then we might expect to get rid of it by a strict quarantine. But, as what the farmers mean is the total exclusion of foreign cattle, and as that means beef at 2s. 6d. a pound, consumers before they join the cry must be quite sure that they will not have to pay the price without securing immunity from the pest. The foreign cattle trade has grown up so quickly that there is not sufficient accommodation for it at the docks. Yards well supplied with water must be provided at the places of debarkation. Cattle ships should be registered and licensed like those for carrying emigrants. The trucks of railways must all be overhauled, and then the public must pay, indirectly, the cost of these precautionary measures—nowhere more needed than between Ireland and England and Scotland and England.

The *Times* has been making the speech of a Mr. Wright, in the Birmingham Chamber of Commerce, in support of patents for inventions, and a speech of Lord Stanley to the Liverpool Chamber of Commerce, *against* texts for one of its customary articles against the claim of the unmoneyed improver to a chance of reward for his thought and his toil. To oppose the *Times*, when it has common sense and public opinion on its side, is about as absurd as whistling against thunder. But still it may be useful to point out that the *Times* has not always been either right or successful in its opposition or its support. Without referring to great public questions, like the new Poor Law, there have been minor occasions in which the personal prejudices, if not the personal interests, of the conductors of the *Times*, have led to attacks which have not been triumphant. For instance, a few years ago, an extremely disagreeable hospital—a hospital for diseases of the skin was proposed to be established in the immediate neighbourhood of the *Times* office. Anything more disgusting than to pass through or near a crowd of such patients it would be difficult to imagine. We speak from experience. Thus irritated, the *Times* thundered away in the largest type of correspondence and leaders, week after week. But the patrons of the Skin Hospital having secured a site central and convenient for the objects of their care, turned a deaf ear to fine specimens of newspaper eloquence. They carried out their plans, collected, on appointed days, their afflicted and disgusting patients, and, unless the hydra-headed London, Chatham, and Dover have swept the walls away, carry on their Samaritan labours to this day. It is not very unreasonable to assume that the personal interests of the controllers of the *Times*, as printers and paper-makers, have in some degree—even if unconsciously—warped the judgment of the first journal of the age. The *Times*, which is always needing the very best presses, the best type, and steam power that can be had for money, must have occasionally suffered the mortifications which fall on other millionaire manufacturers. That is, it must have found patentees of no great means sufficiently independent to be able to say, "Take the improvement at my price, or leave it alone;" instead—as would be the case were there no patent of invention law—of the *Times* being able to say, "Accept our offer for your improvement, for if you do not we can wait until some one does use it, and then copy it." The arguments against a patent for fourteen years to an improver rest on two grounds—the fallacious use of the term "monopoly," and on the inconveniences arising from defects in the laws affecting patents. The denouncers of the monopolies of patents are talking as confusedly as those who when Peel was Home Secretary declared that English liberties were doomed to sure extinction from an organized army of blue policemen. When the Stuarts, the great authors of monopolies, wished to reward a partisan or to raise ready money, they granted an exclusive right to sell some article in common demand. Thus was created the monopoly of sweet wines, and the quart previously sold for sixpence was raised to eighteenpence. In later years Parliaments improved upon the plan, and made the public pay a tax in order that certain British producers might sell goods, at a profitable price, that could be purchased cheaper from foreigners. But the patentee—always excepting the one who borrows an invention from abroad—does not make anything the public have ever enjoyed dearer than it was before, but, on the contrary, in return for an exclusive lease of at most fourteen years, bestows on the public a means of obtaining something better or cheaper than was ever previously known. The worst that can happen to the public is that (under the present law) a patentee may be a dog in the manger—he may neither work his monopoly nor grant leave to others to work it—he may lie slyly dormant, and rush out of his hole to claim damages for the unwitting use of his unknown right. At the very most, fourteen years—a very short span in the history of a nation—will see the end of such an abuse of a privilege, even if no law were passed to cure the evil. But, although many vague statements of the above kind have been made by such fast and loose witnesses as Mr. Scott Russell (who never invented anything worth working in his life), we have yet to hear of an authenticated case of a useful manufacture being impeded by dormant patents. There was once a Permanent Way Company, which tried to absorb all patents affecting the "way" of railroads, but the idea did not long survive its author, and the powers of the Permanent Way Company affect no real improver. If a patent of invention is good for anything, the sooner it is used the better; and if it is good for nothing, then some short method could be devised of extinguishing it.

Let us once more apply to some other subject the objections that are applied to patents of inventions. Let us take land. It is generally believed by economists that stability of possession conduces to the improvement of land. They point out that in the early days of civilization land was neither fenced nor built upon, but a new hut was raised and a new patch cultivated from year to year. They point to the wretched cultivation of the Irish tenants-at-will, and to the causes which have led to the enclosure and division of arable lands formerly held and cultivated in common by towns and parishes. But an ingenious commissioner with a theory in the opposite direction would find a great deal to say against the freehold tenure. We need not travel further than Chancery Lane, London, to see a great public improvement obstructed, and the time of thousands wasted—the lives of many endangered—because one or two freeholders have for more than ten years refused to take a reasonable price for their property. It is not very long since there was to be seen in Stamford Street a block of houses, empty and falling to ruin, the property of eccentric but not lunatic freeholders, who declined to let and refused to repair. Travelling from town to country, there may be found baronets who object to parish roads, and colonels who disapprove of steam-engines in their tenants stack-yards as much as pianos in their wives parlours, and will not allow either. At this moment there are landlords in Bedfordshire who positively forbid the use of reaping-machines, because, although these machines give the tenants more straw for the fold-yard, they cut the stubble too close for game-preserving purposes. Both private individuals and collegiate authorities have been known to refuse either to drain stiff clay or to allow a tenant to

do it at his own expense. And then in Ireland the abuse of the rights of property have been the curse of the country. The late race of landlords looked on all tenants who wore good coats or rode good horses as defrauders of landlords rights. Even now few Irish landlords understand the advantage of laying out money to make land profitable to their tenants. The above are merely a slight sample of the abuses incident to the absolute possession of land by ignorant or by poor landlords. Had Prud'homme been an English lawyer and commissioner, trained in Mr. Chadwick's school, he would have filled a thick volume with examples of his axiom that "property was robbery." One piece of modern cant is to pity the victims ruined by lawsuits arising out of the patent monopoly. But surely those who shed these crocodile tears must forget the long roll of victims registered in the Court of Chancery, ruined by an estate purchased or inherited, or led through a vale of tears by an unexpected bequest. Police reports constantly mention instances of steady workmen who, on the receipt of a legacy of a few pounds, embark with all their families in a course of drinking, only ending in *delirium tremens*, or a charge for assault or murder. Why not pass a law to forfeit to the Crown all legacies under ten thousand pounds?

Without pursuing such illustrations, which might be multiplied *ad infinitum*, any further, we will turn back to the evidence taken before the commission, and see how far it supports the views which would make intellect without capital under all circumstances the humble suitor and slave of the man of capital. If any trade might be expected to complain of the multiplication of patents it would be the sugar refining trade, for we learn that it is the subject of 400 patents. Yet, what does Mr. Macfie, a great sugar refiner, who was called to give evidence against patents of invention, say? He has been in business since 1829, and "on *one* occasion had trouble "with a patentee, whose patent we were unconsciously in-"fringing. We offered £1000 for a licence, which was refused. "We then altered our apparatus, at no small expense, and "since the patent has expired we have not adopted it in ap-"paratus we have recently fitted up at considerable expense." Again, Lord Overstone asks (*Q.* 1945), "Do you find by actual "experience that patents cause manufacturers serious annoy-"ance?"—*A.* "I cannot say I have found it so. That is a "thing that surprises me very much, but if there should be a "reform (*qy.* change) of the laws that would multiply patents, "and which would invest patentees with increased powers, the "state of matters *might* become very troublesome." It may be observed that a change in the law that made patentees mischievously troublesome to manufacturers would not be *a reform*. Mr. Macfie does complain of the tremendous tax imposed on manufacturers by successful patentees; "in one instance (Howard's "patent) one shilling a cwt." But he was not asked whether this payment of one shilling did not give him, as it did, a profit of two shillings a cwt. Mr. Macfie was also afraid that while paying a royalty to English patentees he might be competed by foreigners or colonists using the same process without a patent tax. He cites no instances of such an accident—his objections are all in the *paulo post futuro* tense. Mr. Macfie is a candid man, and being asked, "Do you think it would be an "advantage to abolish patent laws altogether?" answers, "I "should like it exceedingly, but I have no such aim, and I "have very little hope of seeing it." Mr. Macfie can foresee that if patent laws were abolished he would have three courses to pursue—to buy improvements from a needy inventor for a ten pound note; to borrow them from other manufacturers by bribing their workmen to disclose any secret process; and thirdly and lastly, to do nothing in the way of improvement until compelled by competition. The same witness put in the written opinions of five other sugar refiners. Three state decidedly that the sugar trade has "never been embarrassed by multiplicity of patents;" a fourth is not prepared to recommend the abolition of patents. One, Alfred Fryer, of Manchester, says: "In the fifteen years we "have been in business we have only had to adopt three "patented inventions. In two, the sum demanded was not "large; in the third—the centrifugal patents—we had to pay "a large sum."

Sir William Armstrong is one of the few witnesses opposed to patents; and for very natural reasons. He is a very ingenious man, and in his late position was more anxious for fame and power than money. His object was to produce the best artillery, and he wished to have the power of using not only all the metals, but all the wits, of the world. Other inventors, protected by patent law, objected to this appropriation of their ideas, and then he hit on the happy idea of allowing manufacturers to absorb all the advantages of inventors. Being in the vantage-ground of position, credit, and capital, he can no more understand why he should be obstructed by humble inventors, than a despot can understand why Her Majesty should permit an Opposition to speak, vote, and sway public opinion. We search in vain through Sir William Armstrong's evidence for a single fact; we only find the strong opinions of a successful ingenious man impatient of contradiction. At the same time, it is evident that Government, in regard to warlike operations and inventions, stands on exceptional ground, and may be legislated for exceptionally. Mr. Scott Russell is the only other witness opposed to patents whose name is known to the public, and his reputation rests on his talents as a lecturer, a talker, and a *commis voyageur*. He is not a mechanic, and failed miserably as a manufacturer. He lectured the committee in his usual style, but did not give one illustration of the inconvenience of the system he denounced. He says: "I have gone on "in the course of my business, doing my ordinary work, "and have found out other people taking out patents for "what I was doing without calling it an invention, and "then prosecuting me, under a patent they had taken "out, for my own invention." That sounds very pretty, but those who have been in the habit of listening to Mr. Russell's positive style of assertion on *all* subjects would like to have names and dates, and particulars of his "ordinary business." When, however, Mr. Russell was pressed by an acute examiner, he was compelled to make very important admissions, and with characteristic suavity to concede all he had claimed. Thus, Vice-Chancellor Wood said: "As the law at present stands, the benefit is shared "with the public, by granting the inventor a lease, as it were, "for 14 years of his invention, and then the public comes in for "his reversion. Would you think it advisable that those who "are stimulated to invention for the express purpose of im-"proving their trade and business should no longer have that "stimulus, but be compelled to give the benefit of their inven-"tions to the public?" To which Mr. Scott Russell answers: "I think they ought to have a moderate and fair stimulus, but "I do not think one man only should be permitted to manu-"facture a valuable invention." A little further on Mr. Russell loses sight of his original objection to patents, and cites the hot-blast case, where "ironmasters who were making enormous "sums of money wished to get rid of a very small patent rate "per ton." If that were the conduct of ironmasters under a patent law, what chance would there be for an inventor of something equal in value to the hot-blast if he had to rely on the liberality of ironmasters. In the face of such experience, Mr. Spence, of Liverpool, "Confederate Spence," declares against patents, and asserts that "were patents abolished, any "one with an invention of value could find a manufacturer to "take it up." All history shows that manufacturers naturally hate to see the course of trade changed and capital invested in machinery rendered out of date and useless by new inventions. What chance would the discoverer of a better material than gutta-percha for telegraph cables have with the two existing firms who have thousands sunk in gutta-percha preparing machinery? The next Parliament will, no doubt, provide a committee to consider the whole case of patent law, and then we shall hope to get more facts and fewer positive opinions.

The state of the river Thames is, at last, becoming such as to call for the serious examination of the whole of the questions connected with it, in the interests of the proprietors of the water privileges, of the navigation, of the water supply, or of the thousand other uses to which that means of draining the valley are devoted. It was said some time ago that the locks that existed in the upper part of the Thames were not calculated to resist the pressure that was brought upon them, and latterly the floods of the river have caused the disappearance of the lock of Henley-on-Thames, thus bringing matters to a crisis. The importance of the silent highway to the commerce of the country is such, that there cannot be a doubt but that the Government must soon interfere with the regulation of this stream, and the only thing to be feared with the present tendencies of our rulers, is lest they might be tempted to create a central board, that should administer the funds that might be put at their disposal, and the execution of the works they might think necessary to adopt. Yet some measure that should introduce a uniform system of administration in the regulation of the river is clearly wanted, for the existing defects in it may

all be traced to the existence of local government and separate jurisdictions, which have scattered the resources of the community amongst a hungry crowd of dependents, and have left those who would be able to provide a remedy to the existing state of things without resource. There is a difference between the concentration of a service, such as we contend for, in the case of a river that has a known "*régime*," and the centralization of it, that is of a vital importance to the inhabitants of the banks; and it is this concentration that is now so urgently called for in the case of the river Thames that must be treated on its own merits, and that admits of no application of general rules that affect all rivers alike. Many of the affluents of this stream, for instance, are subject to the supply of various kinds of wants, as the Wey is principally devoted to meeting the requirements of the millowners upon its banks, and the Kennet is principally applied to the purposes of irrigation. All these usages require to be taken into account, and the conditions of the drainage of the low lands require to be considered in detail, which they would be were the river placed under the control of a central board.

The directors of the Southwark and Vauxhall Water Company have lately published a report from Mr. Quick, their engineer, which appears to us to contain as many fallacies as it does truths, according to the point of view that any person may take of the question of the constant supply, which is, in fact, in question in this case. It appears that the authorities of the parish of St. Olave's, Southwark, had petitioned for the adoption of the constant supply under the terms of the Metropolis Water Act, and the company had replied to them by the report which we have alluded to, in which Mr. Quick states that in *every* case he was acquainted with the constant delivery had proved to be a failure, in consequence of the waste that it entailed. But this is only partially true. The constant delivery has proved a failure in those cases where there has been no adequate superintendence, or no police regulations to control the waste; but wherever those regulations exist there can be no doubt of the successful result of the system. Mr. Quick parades the cases of Boston and New York, Baltimore and Cincinnati, "of Bristol, Croydon, Dover, Wolverhampton, Preston, Wool-"wich, Rugby, and others," but he forgets to say that in all these the police regulations, and the details of the water supply, were very defective. He does not mention the town of Nottingham, where Mr. Hawksley first introduced the constant supply, and which still retains it with the remarkable result of only a consumption of 14 gallons a head per day; he does not mention the town of Derby, where the same engineer has carried out the constant supply with a consumption of not more than 17 gallons a head per day; he does not mention the towns of Sunderland, Norwich, Durham, &c., in all which the constant delivery system is successfully applied in consequence of the regulations that Mr. Hawksley has established for the supply of the water and for the prevention of abuse. The fact is that Mr. Quick has disguised the real motive that led him to oppose the introduction of the constant delivery, which is the expense that will necessarily be attendant upon the change from the present system to the new one; and it may be also, the extra trouble that it may involve. It will always be a question whether this may be worth while incurring, on the part of the public especially; but it ought to be distinctly understood that the expense of the change from the intermittent service to the constant delivery would cost, at least, about £10 a house, which, under the present state of the law, would have to be borne by the tenants in possession, not by the landlord. As for the provisions that are made by the Act for the prevention of waste, they would be sufficient, we are sure, if properly carried into effect, to secure that object; and the public would thus gain the advantage of having a constant supply without the necessity for any cisterns.

Whilst upon the question of the constant delivery, we may mention that we have lately received a letter from M. Belgrand, the engineer of the Paris Water-Works, in which he mentions that the town had already two engines at work for the purpose of raising the water from St. Maur, and that the works of the canal for leading the waters of the Dhuis were completed. The final opening of the works was delayed in order to allow the intermediate pipes to be tested; but there was nothing that sensibly opposed the delivery of the water from the reservoir of Mesnil Montant, and thus putting a stop to the reproach that Paris was always liable to on the score of its water supply. The distribution of the water will be effected, it must be observed, on the constant delivery, but it is to be suspected that the French people will not tolerate the constant police interference that will be necessary to prevent waste; at present, however, the number of houses in Paris that are connected with the water-mains is not sufficient to produce a decided effect on the supply, though M. Belgrand has already discovered that the rate of consumption per house is about double that which ought theoretically to exist. The question of the mode of supply seems, therefore, as likely to occupy the attention of the French engineers as it evidently does with their English colleagues.

We have also received a notice from the Paris journals of an impudent attempt made by Messrs. Maw and Payne to claim the merit of the arrangement of the Great Exhibition that is now in course of erection in that city; and we must say that the conduct of the professional journals of England, and of the newspapers, has been in this case marked with a signal want of fairness to our neighbours. It appears that Messrs. Maw and Payne inserted in the *Builder*, that piques itself upon knowing so much of what is going on in Paris, their project for this building in the commencement of the year 1861; but the *Builder* did not seem to know of the existence of the *Report of H. I. H. Prince Napoleon*, published in Paris in 1855, on the results of the *Exposition de l'Industrie* in that year, in which all the parts of this scheme are traced out in so many words as to render it impossible to mistake them. The *Times*, and all the small fry of the English papers, have also repeated the accusation of plagiarism; and now, the French authorities are being called before the tribunal of public opinion for having made use of an idea which they had put forth to the world at least five years before it came into the head of their English accusers. Verily Mr. Tite was right when he said, some time ago, that what was wanted in the English mind was a more thorough system of education, and we would add also, a deeper sense of what was required in their international relations. The accusation of plagiarism in question, appeared in the *Times* of the first days of August; it was repeated in the *Builder* of the 5th; yet neither of those papers has noticed the official reply that the French authorities inserted in the *Patrie* of the 4th, which contains the answer given above. There is both bad faith in thus inserting an attack that can hardly be refuted, on account of the ignorance of foreigners of our language and manners; and bad taste, in at once presuming that the idea was so good as to necessarily emanate from "our columns;" there is worse faith in not inserting the claim of the French authorities to their own idea with respect to the building which they had published some years previously, and which they justified as theirs on the present occasion.

Circular to Gas Companies.

THE continued prosperity of the metropolis gas companies, indicated by the accounts for 1864, presented to Parliament in pursuance of the provisions of the Act of 1860, shows that the reductions made and promised in the price of gas were founded on substantial bases, and that there is little fear that the maintenance of the prescribed dividends will be compromised by the well-timed concessions to the public. The total aggregate increase of the rentals of the thirteen companies during the last year was £117,697; and, compared with 1862, the increase in the gas-rental has amounted to not less than £192,132. The total aggregate increase of the capitals of the companies during the past year was £376,319, but in that amount is included the £144,000 of capitalized profits of the Phœnix Company; therefore the actual increase during the year was not more than £232,319, which is only about twice the increase in the gas-rental during the same period. The South Metropolitan is the only company whose accounts exhibit a diminution of the gas-rental compared with the previous year, the falling off amounting to £976. This has arisen not from a smaller demand for gas, but from the reductions in its price from 4s. and 4s. 6d. per 1000 feet to 3s. 8d. and 4s. Though the gas-rental is less, there has nevertheless been an increase equal to ·81 per cent. on the gross profit, which still amounts to 12·08 per cent. on the paid-up capital, and fully justifies the directors in reducing the price. The aggregate average increase in the gross profits of the

whole of the metropolitan gas companies was ·82 per cent. on their capitals and borrowed moneys, the highest amount of profit being that realized by the Imperial Company, which was 13·09 per cent.; that of the London Company was the lowest, it being limited to 7·66 per cent. In only three instances were the gross profits less than 10 per cent. The decrease of 1·89 per cent. on the profits of the Phœnix Company, notwithstanding an increase in the gas-rental to the amount of £14,179, is explained by the fact, already noticed, that the dividends are now payable on £144,000 additional capitalized profits. The improved condition of the Western Company is apparently more remarkable than that of any other. The gross profit exceeded that of the previous year by 2·63 per cent. on the capital and borrowed moneys, and 8·53 per cent. on the gas-rental. The majority of the items of expenditure were less in amount than those in the accounts of 1863, and even with an increase of the rental of £4568, the cost of coals was less by £2130 than in the preceding year. This anomaly may be accounted for by reference to the accounts for 1863, from which it appears that the expenditure for coals in that year was £5192 in excess of that in 1862. The average aggregate increase in the gross profit per cent. on the gas-rental of the 13 companies was 2·622. The Equitable still maintains the lead—though not so far ahead—as in 1863. In that year the profit on gas-rental realized by the Equitable was 52·01 per cent., and the nearest approaching to it was the Phœnix, at 43; but last year the amount per cent. realized by the Equitable was 49·49 per cent., closely followed by the Western at 45·80 by the Phœnix at 45·75, and by the Imperial at 42·64 per cent. The lowest in the list is the London, which realized only 33·29 per cent., though that is an improvement of 4·6 per cent. on the preceding year. This comparatively low rate of profit realized by that company on the gas-rental may be in some degree explained by the appropriation of large sums as compensation for leaseholds about to expire. When we commented on the accounts made up for 1863, we noticed that the increase in the rental of the Imperial Company then nearly doubled that of all the others—the proportions being £21,213 to £45,294—and last year there was the further increase of £42,276, making within the space of two years the enormous increase of £63,439 on the gas-rental. This rapid extension of the demands of the public must of course make the directors of that great company anxious to provide the means of manufacturing and storing an adequate quantity of gas, and it was for that purpose that they applied to Parliament during the last session for power to hold additional land, and to increase their capital. The rejection of their Bill by the House of Lords, without allowing it to go before a committee, has created a difficulty which, when it becomes publicly evident, the Bishops who defeated the Bill may next session repent. The company are bound to supply all householders within their district with gas, and the attempt to do so by enlarging the works within the limited area now occupied must to some extent aggravate the nuisance which it is alleged at present exists, as the company would be prevented from availing themselves of all the appliances by which nuisances may be diminished. One of the satisfactory features of the present returns is that they exhibit considerable increase in the amount received for residual products. In 1863 the total receipts under that head by all the metropolitan gas companies amounted to £299,340, which sum was augmented last year to £360,580.

The reduction in the price of gas to 3s. 4d. per 1000 cubic feet announced by the Independent Company, to take effect at Michaelmas next, naturally draws attention to the accounts of that company; but they fail to present what we believe to be a main cause of the prosperous condition which has induced the directors to make so liberal a concession to the public. The district supplied is a manufacturing one, and is the best in the metropolis for the consumption of gas. It comprises the principal part of the parish of St. Leonard's, Shoreditch, and a large portion of St. Luke's, Old Street. The extreme length of the district is about 1¾ mile, and its breadth 1 mile. It is intersected by the Regent's Canal, upon the banks of which the works are situated, readily accessible to coal barges. The total length of the mains of the company is, we believe, about 60 miles, and the quantity of gas sold annually is about 6 million feet per mile of main. It will be seen, therefore, that there are no dead or unproductive mains, and that the consumption is concentrated within a comparatively small area. The company are in these respects in a more advantageous position than any other of the metropolitan gas companies. The Independent Company, indeed, have always taken the lead in reducing prices, and for many years charged 1s. per 1000 feet less than their neighbours. The accounts rendered by them in the previous year showed a gas-rental in 1863 of £60,550, and a per centage of gross profit on the capital and borrowed moneys of 11·51. In 1864 the price charged was 4s. per 1000 feet, the gas-rental was increased to £65,646, and with a paid-up and borrowed capital of £187,200 the profits exceeded the sum required to pay the prescribed parliamentary dividend and interest by £9273. The reserve-fund being nearly full, a further reduction in the price of gas became compulsory, in accordance with the provisions of the Gas-Works Clauses Act. The only question was the extent of the reduction, and we are glad to find that the directors have so much confidence in the increased prosperity of their undertaking as to venture to reduce the price from 4s. to 3s. 4d. per 1000 feet; and there is little doubt that the prescribed amount of dividends will be amply provided for by the profit of the current year, unless some unforeseen accident intervenes.

It is a curious fact that many persons are so blinded by the nervous apprehension of being cheated by gas companies, that they take no ordinary precaution against being defrauded by those who offer to protect them. An instance of the kind was recently exposed at the Southwark Police Court, where a large consumer of gas stated that he and several of his neighbours had been induced to pay £1 each as a year's subscription in advance to an assumed association professing to be established to protect gas consumers, by properly checking their meters. On inquiry it was ascertained that no such association was in existence at the place specified in the printed receipts that were given for the amount of the subscription. Some such association was at one time formed, and had a location in the Strand, with which Mr. Flintoff was connected; but we understand that it was altogether distinct from the one complained against. It is to be regretted that gas consumers generally do not take the trouble to become acquainted with the registration of their meters, and note at short intervals the quantity consumed, as appears by the index. If that were done we should hear fewer complaints of excessive registrations, and the consumers would find that there is no necessity to apply for the aid of sham associations to protect them from the alleged frauds of gas companies.

It is desirable to note from time to time the effects of competition in the supply of gas, and to observe the practical operation of that vaunted panacea for the grievances of gas consumers. The town of Perth at present affords an illustration and a warning. Mr. Flintoff, by the force of his vituperative and alluring eloquence, succeeded in establishing a new competing company; and the prospect of success seemed, according to his representations, so brilliant, that in 1861 the shares were quoted at 20 per cent. premium. The lapse of four years has, however, produced a sad change in the aspect of affairs. Within the present month fifty £5 shares have been sold at the rate of 15s. per share. Perth must, therefore, for the future be erased from the list of Mr. Flintoff's boasted triumphs.

It is a common prejudice—in which some of the Bishops at least participate—that the exhalations from gas-works are injurious to health. Many facts have come to light to controvert that opinion, but it, nevertheless, maintains its ground, and it is generally suppose that an offensive smell must be hurtful. The question has been examined by two physicians, who have recently made their report, and the conclusions at which they arrived we extract in another column from the *Comptes Rendus*. The result of their investigations is directly opposed to common prejudice and the Bishops. The emanations from the purifiers of gas-works are pronounced to be "of real and proved value "in many cases of diseases of the organs of respiration," and it is proposed to produce artificially in the sick chamber the same emanations by means of a new volatile liquid, precisely similar, chemically, to the exhalations from the purifiers of gas-works! Many strange revolutions have been produced by scientific inquiry, but few have been more extraordinary than the proposed cure of consumption by surrounding the bed of the patient with the effluvium from gas-works. Those medical men in this country who have hitherto pronounced all exhalations from gas-works to be injurious to health, will do well to consider this deliberate report by two distinguished French physicians, and to institute inquiries of their own, based on facts and not on prejudice.

DETAILS OF INCOME, FOR THE YEAR 1864.

Name of Company.	Total Gas-Rental.	Common Gas, at 5s., 4s.9d., 4s.6d., 4s.5d., 4s.3d., 4s., & 3s. 8d. per 1000 Cubic Feet.	Cannel Gas, at 6s. per 1000 Cubic Feet.	Public Lights, including Lighting and Contracts.	Meter-Rents.	Old Materials.	Products.	Miscellaneous.	Total Income from all Sources.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Chartered	256,878 1 9	178,184 4 6	54,482 11 8	24,211 5 7	4,548 14 0	1661 12 2	48,888 0 2	4,213 14 10	316,190 2 11
City of London	103,548 8 9	94,063 9 3	4,995 18 11	4,489 0 7	None chgd.	924 13 11	21,271 5 3	7 1 0	125,751 8 11
Commercial	120,731 2 10	106,543 12 10	..	14,187 10 0	None chgd.	..	23,678 12 3	1,270 18 1	145,680 13 2
Equitable	72,774 3 9	58,837 18 1	7,400 18 5	6,535 7 3	1,549 11 2	135 9 10	14,290 2 3	394 15 0	89,144 2 0
Great Central	77,237 6 0	70,139 5 11	..	7,098 0 1	None chgd.	..	23,395 6 8	21 10 0	100,654 2 8
Imperial	461,336 17 7	395,172 1 2	..	66,164 16 5	7,492 18 0	760 19 3	88,208 17 3	2,085 10 8	559,885 2 9
Independent	65,646 0 1	59,795 19 10	..	5,850 0 3	1,996 16 0	235 14 6	16,840 0 4	956 2 2	85,674 13 1
London	151,004 1 11	124,218 10 0	7,974 18 11	18,810 13 0	2,210 9 0	1515 11 6	35,588 19 10	10 2 6	190,329 4 9
Phœnix	158,568 15 9	138,602 13 11	..	19,966 1 10	None chgd.	..	41,861 11 3	871 19 1	201,302 6 1
Ratcliff	30,765 11 4	26,612 4 6	..	4,153 6 10	10 18 8	191 12 8	7,738 15 9	102 14 11	38,809 13 4
South Metropolitan	64,350 0 3	56,195 11 6	..	8,154 8 9	None chgd.	197 17 8	18,666 0 11	2,341 7 0	85,555 5 10
Surrey Consumers	54,774 16 7	42,711 8 9	..	12,063 7 10	None chgd.	368 8 4	13,728 19 3	3,106 17 7	71,979 1 9
Western	83,937 18 1	..	72,579 17 6	11,358 0 7	2,257 10 6	94 18 0	6,424 1 11	..	92,714 8 6
	1,701,553 4 8	1,351,077 0 3	147,434 5 5	203,041 19 0	20,066 17 4	6086 17 10	360,580 13 1	15,402 12 10	2,103,670 5 9

ABSTRACT OF DETAILS OF INCOME AND EXPENDITURE, SHOWING THE PROFIT REALIZED.

Name of Company.	Total Expenditure on Revenue Account.	Gross Profit.	Capital and Borrowed Moneys.	Gross Profit per Cent. on the Capital and Borrowed Moneys.	Gross Profit per Cent. on the Gas-Rental.
	£ s. d.	£ s. d.	£ s. d.		
Chartered	223,950 19 6	92,239 3 5	780,000 0 0	11·82	35·90
City of London	87,100 13 1	38,650 15 10	435,445 0 0	8·87	37·32
Commercial	97,551 4 7	48,129 8 7	381,857 5 0	12·60	39·86
Equitable	53,127 9 0	36,016 13 0	284,800 0 0	12·64	49·49
Great Central	70,210 12 5	30,443 10 3	251,400 0 0	12·10	39·41
Imperial	363,163 10 7	196,721 12 2	1,501,815 0 0	13·09	42·64
Independent	61,486 15 10	24,187 17 3	187,200 0 0	12·92	36·84
London	140,049 18 5	50,279 6 4	656,017 0 0	7·66	33·29
Phœnix	128,756 1 11	72,546 4 2	759,000 0 0	9·55	45·75
Ratcliff	27,967 1 5	10,842 11 11	104,448 6 8	10·38	35·24
South Metropolitan	61,384 16 4	24,170 9 6	200,000 0 0	12·08	37·56
Surrey Consumers	48,536 13 1	23,442 8 8	216,274 0 0	10·83	42·79
Western	54,268 11 1	38,445 17 5	303,050 0 0	12·68	45·80
	1,417,554 7 3	686,115 18 6	6,061,306 11 8	11·32 Average.	40·31 Average.

DETAILS OF EXPENDITURE ON REVENUE ACCOUNT, FOR THE YEAR 1864.

Name of Company.	Coals, including Carriage and Dues.	Purifying Materials.	Supervision and Labour in Manufacture of Gas.	Ordinary Repair and Maintenance of Premises, Tools, and other Implements.	Rents, Rates, and Taxes.	Salaries.	Collectors Commission.	Stationery, Printing, and General Charges.	Directors.	Auditors.	Expense of Distribution and Ordinary Repairs of Mains and Services.	Restoring and Replacing Meters.	Law and Parliamentary Charges.	Bad Debts and Extraordinary Expenses.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Chartered	125,189 19 4	3,199 8 9	29,649 8 11	23,756 13 6	8,553 9 11	7,250 1 5	3,444 1 2	3,588 3 10	2,386 13 0	131 5 0	6,152 2 4	5,848 1 4	551 19 0	4,249 12 0
City of London	43,796 5 6	648 2 8	15,571 6 7	6,771 13 8	2,010 13 1	1,473 6 8	742 10 0	969 19 6	1,424 10 6	109 4 0	7,844 9 11	2,519 19 1	1,156 8 3	2,062 3 8
Commercial	55,487 12 6	2,778 14 2	17,157 6 7	5,360 12 0	3,307 3 8	2,197 6 0	1,349 11 6	2,169 9 9	1,500 0 0	150 0 0	4,869 5 4	758 3 5	465 19 8	—
Equitable	30,437 14 8	986 2 0	6,384 16 0	4,962 19 9	1,385 13 1	1,754 19 2	923 11 6	661 1 1	1,300 0 0	90 0 0	3,345 11 3	763 14 8	131 5 10	—
Great Central	33,666 7 3	594 9 5	11,088 2 2	3,804 7 11	1,639 7 1	1,374 2 0	867 13 7	1,658 11 9	1,500 0 0	67 6 6	6,361 2 0	1,041 17 8	762 4 1	5,785 1 0
Imperial	200,353 10 7	3,957 16 3	45,616 3 6	53,082 0 10	7,481 14 6	7,963 6 1	7,171 12 11	3,774 18 4	2,500 0 0	157 10 0	23,372 6 3	2,815 8 1	1,834 10 8	3,082 12 7
Independent	34,423 0 1	689 11 0	12,465 4 0	2,375 1 0	1,304 18 0	1,330 0 0	929 7 9	1,083 2 7	1,200 0 0	100 0 0	2,065 10 0	1,832 16 1	782 7 2	905 18 2
London	63,699 15 8	1,236 18 3	18,829 1 7	29,822 16 7	4,640 8 9	3,466 15 0	2,136 15 8	2,124 2 10	1,492 3 9	99 9 6	8,105 12 0	3,304 18 4	1,091 0 6	—
Phœnix	66,656 2 0	1,649 15 6	17,667 16 3	12,163 11 2	4,369 14 1	2,280 8 8	2,158 8 9	2,514 8 9	2,000 0 0	100 0 0	12,818 2 6	2,767 7 5	702 6 2	908 0 8
Ratcliff	14,855 7 4	438 18 7	5,763 4 1	993 9 3	1,074 17 7	785 0 0	299 15 0	482 10 9	800 0 0	31 10 0	2,130 19 8	5 1 6	149 15 11	156 11 9
South Metropolitan	32,015 16 11	646 6 9	9,770 1 0	4,151 10 2	1,791 15 10	1,877 5 0	850 7 3	1,169 14 7	1,000 0 0	100 0 0	4,644 17 5	2,891 15 5	173 2 1	302 3 11
Surrey Consumers	25,864 19 4	675 0 0	9,983 12 0	3,345 4 1	1,739 11 11	958 1 3	646 2 1	802 11 1	1,500 0 0	63 0 0	1,851 3 11	456 19 1	254 2 4	396 6 0
Western	35,019 9 10	273 9 3	6,976 17 4	2,487 13 8	1,032 18 7	1,915 18 1	973 2 7	779 11 5	1,250 0 0	80 0 0	2,015 15 4	656 16 2	313 8 7	493 10 8
	761,466 1 0	17,774 12 7	206,923 0 0	153,077 13 7	40,332 6 1	34,626 9 4	22,492 19 9	21,778 6 3	19,853 7 3	1,279 5 0	85,576 17 11	25,662 18 3	8,368 10 3	18,342 0 0

METROPOLIS GAS COMPANIES, 1864.

REVENUE ACCOUNT, *compared with that of* 1863, *showing the Increase or Decrease in each Item.*

	Chartered.		City of London.		Commercial.		Equitable.		Great Central.		Imperial.		Independent.		London.		Phœnix.		Ratcliff.		South Metropolitan.		Surrey Consumers.		Western.	
	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Total gas-rental	16442	..	7888	..	7603	..	3147	..	4197	..	42276	..	5096	..	8200	..	14879	..	672	..	..	976	3705	..	4568	—
Common gas	12636	..	8986	..	7352	..	3179	..	3965	..	40608	..	4950	..	8561	..	14187	..	621	..	2305	..	2851	..	..	—
Cannel ditto	3792	..	309	..	..	..	685	..	..	..	..	..	..	..	499	..	..	..	..	..	..	..	..	..	4007	—
Public lights, including lighting and contracts	14	..	..	1407	250	..	..	718	232	..	1669	..	145	..	..	861	693	..	52	..	..	3282	855	..	562	—
Meter-rents	4	..	None	chgd.	None	chgd.	15	..	None	chgd.	965	..	88	..	34	..	None	chgd.	..	1	None	chgd.	None	chgd.	154	—
Old materials	..	9	173	..	..	..	..	95	..	63	..	543	..	2	1511	..	..	328	115	..	51	..	368	..	29	—
Products	11937	..	2122	..	3386	..	1424	..	4030	..	16753	..	1223	..	6384	..	8467	..	717	..	2899	..	1403	..	496	—
Miscellaneous	11	..	..	890	..	1	250	..	..	39	..	606	340	..	..	9	871	..	..	74	276	..	3013	..	..	—
Total income from all sources	28385	..	9292	..	10988	..	4740	..	8125	..	58847	..	6744	..	16120	..	23891	..	1430	..	2250	..	8490	..	5248	—
Ditto expenditure on revenue account	15491	..	1548	..	8890	..	3943	..	2963	..	33903	..	4125	..	6814	..	13138	..	1317	..	626	..	5221	..	..	3616
Gross profit	12893	..	7743	..	2098	..	..	203	5161	..	24943	..	2619	..	9305	..	10753	..	113	..	1623	..	3269	..	8863	—
Capital and borrowed moneys	60000	..	3650	..	23916	..	4800	..	..	..	21385	..	..	182	3837	..	219000	..	10000	..	..	..	21006	..	8877	—
Gross profit per cent. on capital, &c.	·80	..	1·72	..	..	·26	..	·29	2·05	..	1·49	..	1·40	..	1·38	..	..	1·89	..	·97	·81	..	·50	..	2·63	—
Ditto ditto on the gas-rental	2·90	..	5·02	..	..	·82	..	2·52	4·80	..	1·65	..	1·22	..	4·60	..	5·75	..	..	·41	3·05	..	3·29	..	8·53	—

METROPOLIS GAS COMPANIES, 1864.

EXPENDITURE *compared with that of* 1863, *showing the Increase or Decrease in each Item.*

	Chartered.		City of London.		Commercial.		Equitable.		Great Central.		Imperial.		Independent.		London.		Phœnix.		Ratcliff.		South Metropolitan.		Surrey Consumers.		Western.	
	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Coals, including carriage and dues	12121	..	1131	..	2929	..	4300	..	2212	..	13306	..	2372	..	4513	..	7362	..	168	..	3332	..	3688	..	..	2130
Purifying materials	286	..	..	1466	1154	..	430	..	..	343	..	1151	145	..	891	..	666	..	..	119	..	373	225	..	..	271
Supervision, labour, &c.	4312	..	2524	..	973	..	174	..	1269	..	6293	..	575	..	2509	..	1860	..	115	..	..	550	1773	..	482	—
Repair and maintenance of premises, tools, &c.	956	..	..	1326	..	387	..	465	628	..	11752	..	..	640	1251	..	..	190	..	230	173	..	..	438	..	1751
Rents, rates, and taxes	..	512	..	238	307	..	371	..	..	357	1566	..	..	39	..	1036	..	1010	76	..	272	..	..	159	79	—
Salaries	..	95	13	..	93	..	242	..	..	119	..	408	223	..	128	..	69	..	19	..	170	..	26	..	..	165
Collectors commission	131	..	32	..	..	75	5	..	35	..	545	..	25	..	42	..	160	..	..	2	69	..	27	..	33	—
Stationery, printing, and general charges	470	..	..	45	218	..	..	2	285	..	482	..	221	..	..	2091	501	..	..	56	108	..	121	..	..	75
Directors	173	..	509	..	..	..	..	..	500	..	..	..	..	..	42	..	..	..	..	..	..	..	500	..	..	—
Auditors	25	..	..	..	13	..	..	..	2	..	..	..	..	..	3	..	..	..	..	6	..	..	..	..	..	—
Distribution and repair of mains and services	..	4931	..	3243	3369	..	294	..	..	310	1150	..	761	..	219	..	3186	..	1190	..	..	2096	938	..	69	—
Restoring and replacing meters	139	..	..	190	..	146	..	236	166	..	36	..	177	..	268	..	..	333	..	13	..	156	36	..	..	197
Law and parliamentary charges	58	..	1090	..	443	..	..	172	..	3	896	..	282	..	74	..	675	..	148	..	..	298	223	..	313	—
Bad debts and extraordinary expenses	2408	..	1319	..	..	..	..	..	..	..	..	203	22	..	..	..	291	..	24	..	..	24	..	1737	..	6

Communicated Article.

(*All articles inserted under this head being copyright, the right of reproduction or translation is reserved.*)

PROPOSED APPLICATION OF THE EMANATIONS FROM GAS PURIFIERS TO THE CURE OF DISEASES OF THE ORGANS OF RESPIRATION.

By MM. Burin de Buisson and De Maillard.

[Extracted from the *Comptes Rendus de l'Académie des Sciences*, June 26, 1865.]

The authors of this communication resume their researches and observations on the subject that they had been employed upon by the following observations:—

1. It follows, from numerous facts observed during the last years, both in France and Germany, by many distinguished physicians, that the emanations from the purifiers of gas-works are of a real and proved value, in many cases of diseases of the organs of respiration, when the conditions under which these emanations are produced are favourable.

2. When there is inconstancy in the therapeutical results, it arises solely from the inconstancy of the chemical composition of the emanations, or from the variations in the mode of their being administered.

2. There is inconstancy in the composition of the emanations, in consequence of the different modes of purification adopted in the various factories; there is, in the same factory, inconstancy in this respect, on account of the degree of saturation, more or less great, of the purifying ingredients, or the difference that may prevail in the position from which the coal is extracted; or from some circumstances attending the manufacture, that may differ from hour to hour.

4. There is inconstancy in the mode of administering these vapours, on account of the general state of the atmosphere, whose degree of calm or agitation may disperse or concentrate, in a great measure, the curative ingredients; and hinder, in either case, the regular and useful effects of the vapours.

5. Analysis has proved that the emanations from the purifiers are composed of curative principles, which must according to our views, be considered as powerful in some cases, as inert in others, and, according to us, as hurtful in others.

6. Gazeol, the synthesis of this principle—which, until chemical experience decides the question, appears to us to be the representative of the curative properties—seems to us to reproduce integrally in the sick room of a patient, the complicated emanations which isolated experiments upon each of their elements had seemed to show were the real agents of cure in the atmosphere of the purifiers.

7. We can affirm that this body may be employed without danger in any place, or at any time whatever, and that it will keep without being exposed to change.

8. If experience should sanction our opinion on the therapeutic employment of this ingredient, a mode of treatment which was hitherto only a therapeutic curiosity may become an habitual means of combating disease, which would be applicable without difficulty and at a low price in many diseases of the organs of respiration.

9. Gazeol, having as its base, or vehicule, the brown ammonia of gas factories, at 20°, it will be sufficient to place it in the proportion of 10 or 20 grammes upon a saucer or a plate, to allow of its evaporating spontaneously at the temperature of 68° or 75° Fahr., in such a manner as to produce in the chamber of the patient the ambient atmosphere that would be charged with the curative properties of the purifiers. The physician might then prolong their action, he might intensify it, or he might modify it in any way that he thinks would be advisable.

ON VENTILATION.

By General Morin.

[Extracted from the *Comtes Rendus de l'Académie des Sciences*, July 31, 1865.]

The principal conditions which the dispositions for causing the arrival of fresh air, and the extraction of the vitiated atmosphere in the inhabited apartments that it may be desired to keep healthy, by means of a regular ventilation, ought to satisfy, being that the first of these currents should arrive as far as possible from the persons affected, and to evacuate the second as closely as possible to them, has frequently led to the formation in the upper parts of the buildings (in the roofs, in fact) of chambers in which the hot air furnished by the heating apparatus is mixed with a certain proportion of cold air, and is then allowed to pass through the ceilings, at a moderate degree of temperature, to the places that it may be desired to warm, and to keep salubrious.

But this system, that is well suited to the winter, the spring, and the autumn, and which is very often the only one admissible in the case of buildings already constructed, presents the inconvenience of only allowing in the summer season air to penetrate into the rooms to be ventilated, which in traversing the roofs has acquired a temperature that is notably superior to that of the external air, thus opposing one of the principal objects of ventilation, which must consist in regulating the interior temperature at will. This difficulty had presented itself to me in the case of the great amphitheatre of the Conservatoire des Arts et Métiers, and in designing the project for the warming and ventilation of the meetings of this academy that has been requested of me. It exists equally in the case of the hall of meeting of the Société d'Encouragement, and would be repeated almost every summer when local conditions would not permit the direct resource to the atmosphere, by causing it to pass through cellars sufficiently large and salubrious, before the new air should be introduced into the place of meeting. It is owing to the heating of the roofs, that is produced by the sun's rays during the day-time, and the elevation of the temperature which follows in the interior of the roofs, and which lasts long after the setting of the sun. This effect is sensible with every kind of covering, and it is more so when copper, zinc, or lead is used upon laths that are thin, and more especially when a part of the roof is composed of glass. The inconvenience of the warming of the air in roofs, and in the upper parts of buildings, is not only an obstacle to the establishment of a good system of ventilation during summer; it makes itself felt at other seasons in a very inconvenient manner at times.

Thus lodgings and shops established in the roofs of houses are exposed to this inconvenience, and become in this manner very insalubrious. If the opening of windows or of skylights diminishes to a certain extent the inconvenience of this state of things, it nevertheless increases the evils complained of, by the currents of air that are produced by the presence of orifices that are too numerous. In the full sunshine these openings do not suffice to moderate the temperature, and it is by no means rare to observe that the temperature of the rooms placed in the roofs ascends to as much as 104° or 110°, when the external air is only 86° or 90°. The stations of railways, in spite of the permanent openings that are left in their roofs, at the ridge and at their extremities, are nevertheless during summer real hothouses, whose habitation becomes exceedingly dangerous, and painful for the workmen employed upon the material of the roadway and stock. In the immense shed of the railway to Lyons, in the first days of the month of July of this year, the temperature exceeded 104°; in that of the Eastern Railway it has been 110°; and in that of Strasbourg as much as 118° Fahr.

The research into the means of preventing this excessive and inconvenient heating of the air in the higher parts of buildings is, then, not less interesting, as far as railway-sheds, places for public meeting, worship, &c., are concerned, than for the buildings about to be ventilated; and it will be seen in the sequel that the solutions which appear to be the most preferable for these would apply themselves equally, and with small expense, to the class of buildings thus referred to. These solutions are of two kinds; the first has the object of cooling the air that it is proposed to admit; the other seeks to oppose the heating of the passages through which the air must pass, or through which it is introduced. These two modes can be applied concurrently to attain the final end, which is to moderate or lower the temperature of the place occupied.

The experiments executed at the Conservatoire des Arts et Métiers, and which I have already recounted to the Academy bore upon four different methods, and they have led me to the conclusions that may be thus expressed.

By the first process, I sought to refresh the air drawn in by the chimney of aspiration by causing it to pass over a jet of water, divided into a pulverulent state. This process only produced in the air submitted to it a lowering of the temperature of about 3°; it requires a considerable volume of water, and a considerable motive power, which is not always at hand, and whose expense would be out of all proportion with the result, if it were established solely for this purpose. This system can, therefore, only be regarded as an exceptional resource.

The second process consists in causing the air to pass against the linings of envelopes, or metallic reservoirs, behind which water, more or less cold, circulates. Founded upon strict principles of physics, this process is perfectly successful, but it requires the use of surfaces of a considerable development in comparison with the volume of the air to be cooled, even when the water that is used is firstly cooled by a mixture of ice, whose weight in kilogrammes ought to be nearly equal to the volume of the air cooled, measured in mètres. This system must, then, be considered to be generally inadmissible in practice.

The third and fourth processes, more directly copied from the ordinary phenomena of nature, appear to be alone applicable in every case, and to be sufficient for ordinary wants. One of them consists in insuring, by the opening of numerous and large openings, the admission and the egress of the air, that should at all times permit dispositions to be effected that would be always successful, and executed at small expense. The proportions of the orifices of admission and evacuation ought to be calculated so that the whole of the air should be capable of being renewed twice in an hour, and it is better not to count upon a velocity of flow of more than 16 or 20 inches per second. The chimneys for the extraction of the air had better be in sheet iron at their external part, in order that the sun might increase their rate of discharge by increasing their temperature. These chimneys ought to be 10 feet or more above the height of the roof of the building they are intended to serve. The orifices of admission of the air should be as numerous as possible, and, if possible, they should be open on the side that is not exposed to the sun. Their dimension should be determined by the condition that the air should not traverse them with a velocity of more than 1 foot or 1 foot 4 inches in a

second; and that the volume of the air introduced should suffice for the total renewal of the air twice within the hour. The windows exposed to the action of the rays of the sun should be provided with sun-blinds, or by blinds on the exterior, unless they should be of the shape of skylights on hinges—in which case they would be subject to watering—and covered with a cloth, which constitutes the fourth process. For workshops and other localities lighted with gas, care should be taken to get rid of the products of combustion, either by a direct communication with the external air, or, if possible, by ventilating chimneys, the activity of whose action they would increase. It must be evident that these chimneys must be provided with valves that should permit the regularization of their action, according to the state of the weather.

The fourth process, which will be susceptible of being applied to the greater part of buildings or private houses in Paris, when the new works for the supply of water shall be completed, is nothing more than an imitation of the effects of the rainfall, but it is much more efficacious. It only requires about 47 cubic feet of water per hour to moisten 120 yards superficial of roofing, and to remove this entirely from the effects of the sun's heat. Applied the first thing in the morning, and continued as long as the sun acts, it not only hinders the heating of the roof, but it can, provided the temperature of the water be lower than that of the atmosphere, maintain the inner surface of the roof at a temperature which shall be at a degree notably inferior to the latter, and it will cool the air that will enter the roof. This service of watering being merely accidental, and it being only applicable for 60 days in the year at the most, it is easy to see that, for the shed of an immense railway station, as that of Orleans for instance, which is about 165 yards long and 32½ yards wide, the annual expense would not exceed much more than £40.

The two last measures that we have called the attention of the Academy to, for the purpose of diminishing the excessive elevation of the temperature in the lodgings, or in the workshops formed in the roofs of buildings, in the sheds of railways, in circuses, and other places of public resort, are, one of them, that of ventilation by means of continually renewing the air, always applicable; while the other, that of watering, can almost always be applied in large towns. The application of them would allow the interior ventilation, in all seasons, of places of public meeting, and it seems to me to allow of the introduction of a means of increasing the healthiness of the public sufficiently important to merit the attention of the Administration of Paris.

On reading this memoir, M. Regnault addressed the following observations to the Academy:—

I was charged, in the year 1854, by the Minister of State, to propose a system of ventilation for the buildings then in course of construction for the Great Exposition of 1855. I was instructed to principally direct my attention to the elevation of temperature that would be produced by the summer's sun in the vast galleries and the sheds, submitted to the direct radiation of the roof. In the project that I submitted to the Minister, I rejected all the processes that were founded on the cooling of the air of the rooms by artificial physical means, and those in which ventilation was produced by machines. These measures have always appeared to me inefficacious, embarrassing, and much too costly. I have always thought that the heat which is produced by the solar radiation would give a force more than sufficient to realize all the ventilation that could be desired in summer. But it must be well applied, and it must not be allowed to warm the inner surfaces of the rooms, or the public that may be in them. Now this last result has been attained to the greatest extent in the galleries of the first story of the Palais de l'Industrie, which serve for the annual exhibition of paintings. I think that this might have been avoided if the parties who had charge of the works had observed the prescriptions that I had laid down for them.

The buildings of the Exposition of 1855 consisted of three separate parts, viz.:—1. The principal building, that has been kept up under the name of the Palais de l'Industrie.—2. The great gallery, built upon the Cours la Reine, and which was parallel to the Seine.—3. A temporary building, constructed in the Champs Elysées, for the exhibition of works of painting and sculpture.

I demanded that in the long gallery towards the river the zinc roof should be doubled. The half cylinder in the interior was at a distance of about 8 inches from the exterior cylinder, and it formed the ceiling of the gallery. The outer cylinder formed the roof, properly speaking, and received the direct action of the sun's rays. Upon the upper edge of this cylinder there were numerous chimneys in wrought iron, of rectangular section, so that they presented their broadest face to the action of the sun. Thus the interval between the two metallic cylinders constituted a great chimney warmed by the sun, and which drew the air from the gallery at the height of the springing of the vault, according to a large section, for its width was 8 inches, by the whole length of the gallery on both sides. I proposed to take the fresh air of the outside from the north side. For this purpose a great number of small canals were executed in brickwork, under the ground, and they terminated on the outside with short chimneys, resting against the wall, for the purpose of leading the air to the middle of the gallery. The orifice of each of these channels was surmounted with a very large column of cast iron, of about 5 feet high, looking like a pedestal from the outside, which might serve either as decoration or as supports to the objects that might be exposed upon them. The air from the outside thus arrived at the level of the heads of the visitors, it thence poured down without producing those draughts that are so injurious and disagreeable, and which cannot be avoided when the air is introduced on the level of the ground.

It is evident that the double roof in zinc prevents the summer heat from radiating directly upon the inner surfaces, and upon the heads of the visitors; it heats the outer coating of zinc, but it is afterwards made use of to produce the current of air in the annular space.

I proposed the same principles for the ventilation, and for preventing the excessive heating, of the great Palais de l'Industrie. In this case it was also necessary to form a double roof in zinc, to constitute the great chimney of ventilation under the sole action of the sun's heat. The external air was to be taken against the walls, in the shade, at both extremities of the Palace; it thence went into a large gallery, underground, that was executed in masonry, and covered with an impermeable cement, and that followed the axis of the building; and, finally, it poured out by means of a series of pedestals, forming the ends of large pipes, which formed part of the decoration of the hall, and received the trophies that were there erected.

As to the buildings intended for the exhibition of paintings, I was much assisted, in consequence of the whole management of the works being under the direction of M. Lefuel. The roofs, with their skylights, were made double, and they were surmounted by chimneys, in order to produce the draught by the action of the sun. The air was supplied in the halls by means of chimneys in planks applied in the four angles of the hall, and descending to the middle of it. The air was taken from courts, in the shade, and brought as nearly as possible into the middle of the rooms, in hollow pedestals, whose orifices terminated above the heads of the spectators. These orifices carried objects of art, &c., and they were surrounded by seats. The scheme that I had proposed was thus carried out as closely as it could be in the gallery of pictures—that is to say, in a building already commenced. It met with all kinds of opposition in the galleries intended for the exposition of objects of industry, and the works that were already commenced were obliged to be laid aside.

I have thought it necessary to give these explanations to the Academy, in order to show that in 1854, in a report which may yet be found in the Ministry of the Civil Buildings, I had proposed the application of the simplest laws of physics, to which General Morin has this day given the preference in the memoir which he has just read.

General Morin said, in reply to the remarks that had fallen from M. Regnault, that "the disposition indicated, and to a certain extent applied, by M. Regnault for the purpose of getting rid of the warm air was perfectly rational, and in every way in accordance with the principles which I recommended the application of, but it would lead to the establishment of a double roof to the buildings, in order to avoid the inconvenience that was of an accidental duration for every year; that is to say, to the adoption in a temporary manner, and sometimes a very expensive one, of an inner surface to a roof. As to the introduction of the fresh air, I think it important to remark, that even in places that are appropriated to public circulation the arrival of air by orifices on the surface of the ground presents grave disadvantages, and that it would not be possible, in the great number of cases, to multiply their number sufficiently to restrain the velocity of the air arriving within reasonable limits."

Register of New Patents.

2523.—Frederick Noble, of 2½, James Street, Cannon Street Road, St. George's-in-the-East, in the co. of Middlesex, engineer, for "*New and improved machinery for raising and applying water and other fluids.*" Provisional protection only obtained. Dated Oct. 13, 1864.

In carrying out this invention the inventor employs iron, or any other kind of metallic pipe, or pipes made of any other suitable material, with air-tight chambers or reservoirs into which the water or other fluids are delivered near the top, a valve on the aperture preventing its returning back. The water or other fluid is raised out of the chamber or reservoir by another aperture near the bottom, which aperture is connected by the next pipe, which delivers the water or other fluids into the next chamber or reservoir near the top, like the first, and so it is raised to any required height. The machine is worked by a pump, or any other suitable contrivance by manual or motive power. The object is to break the column of water or other fluid at every chamber or reservoir, and it will remain stationary in the pipes, chambers, or reservoirs, when the pumps or other suitable contrivances are not at work.

2525.—John Watson, of Lombard House, George Yard, in the City of London, F.G.S., consulting mining engineer, for "*Improvements in the manufacture of hydrocarbons.*" Provisional protection only obtained. Dated Oct. 13, 1864.

This invention consists in manufacturing hydrocarbons from the upper and middle lias shales, a material not hitherto employed in this manufacture. For this purpose lias shale is placed in retorts or vessels, and subjected to the action of a low red heat, by which the hydrocarbon products are distilled over, and they are condensed in like manner to that

in which hydrocarbons obtained from other minerals have before been condensed.

2560.—JOHN CASSELL, of La Belle Sauvage Yard, in the City of London, publisher, for "*Improvements in apparatus for the carburation of gas and atmospheric air.*" A communication. Patent dated Oct. 17, 1864.

The apparatus is composed of two superposed vessels, or an inverted vessel, divided by horizontal partitions. The upper vessel is intended to contain the volatile liquid, which is supplied as hereafter described to the lower vessel, in which it becomes vaporized. A tube soldered or luted to the bottom of the upper vessel, extends to the level of the lower vessel, at which it is desired to maintain the liquid therein. The upper vessel and the tube forms, as it were, an inverted bottle, of which the tube forms the neck. The lower vessel is divided by vertical partitions, forming a labyrinth, in order to cause the gas or air which is to be carburetted to traverse an extended surface, thereby becoming mixed with a large proportion of vapour. The outer partitions, or those more distant from the centre, are by preference placed nearer together than the inner partitions. The partitions are soldered or luted to each other, and to the body of the apparatus they are connected, both at top and bottom, by metal cloth, which occupies the whole breadth of the vessel. In order to increase the vaporizing surface, the chambers are supplied with cotton wicks, mixed or interwoven with metal cloth, or instead of cotton wicks, sponge, charcoal, or other material, is employed which is capable of absorbing or raising the liquid in which it is inserted. The top of the partitions and the upper layer of metal cloth, are covered with felt, the pressure of which against the lower surface of the upper vessel completely insulates the chambers therefrom. The vertical partitions do not extend to the bottom of the vessel. At the bottom, and by preference in the centre of the vessel, there is a recess, the object of which is to receive the water which is generally held in suspension in lighting gas on its exit from the meter, and which, by becoming condensed in the apparatus, would in time, if the apparatus were flat at the bottom, replace the volatile liquid, and prevent the proper working of the apparatus. This recess is furnished with a tap for emptying it, constructed by preference of three parts, viz., first, the body of the tap, soldered or luted to the apparatus, and extending to the outside of a hollow stand, or support of the apparatus; second, a stopper; and third, a cap, which screws on to the outer end of the body, and to the head of the stopper.

The hydrocarbon liquid is introduced into the upper vessel by an orifice at the top closed by a stopper, which is screwed into a socket surrounding the orifice. To ensure hermetic closing, a second threaded stopper or block is screwed into the socket, and both stoppers are furnished with a leather or caoutchouc washer. A float surmounted by a vertical rod is placed in the upper vessel, to indicate approximately the quantity of liquid in that vessel, which float carries rings or lugs free to slide on vertical guides. In order to prevent the liquid in the vessel passing down through the tube and filling the lower vessel, when the orifice is open the upper end of the tube is closed by a stopper constructed by preference of a metal washer, formed with a threaded hole in the centre to receive the upper end of a pin carried by a conical plug. The pin, before entering the hole in the washer, passes through and compresses several washers of felt, cork, or other suitable yielding material, and it has fixed to its upper surface a piece with an undercut hole in the centre to receive a projection on the lower end of a vertical rod, which is free to turn therein, and which is screw-threaded near its upper end, and passes through a stopper which closes another orifice at the top of the upper vessel. The top of the rod is formed square, in order that it may be easily turned to open or close the tube as required. The stopper is threaded to screw into the threaded sides of the orifice, and a second threaded stopper or plug is then screwed on to make the closing hermetic, and both stoppers are furnished with leather or caoutchouc washers.

This apparatus is also applicable to the carburation of atmospheric air introduced in regulated quantities, whereby lighting and heating properties are imparted to it, which allows of its being advantageously employed as a substitute for gas. This object is effected either by employing a single apparatus supplied with a hydrocarbon sufficiently volatile and carbonated to produce the quantity of inflammable vapour necessary for the number of burners to be fed, or by employing two apparatuses, the first supplied with a very volatile hydrocarbon, whatever be its lighting powers, and the second with a less volatile hydrocarbon, but very rich in carbon; so that the vapours from the first forced into the second by the current of air become assimilated, and by dissolving the heavier vapours of greater lighting properties, a good result is easily obtained.

2586.—AUGUSTE CLAVEL, négociant, of 51, Rue de Malte, Paris, in the empire of France, for "*An improvement in the means of holding or supporting glasses, shades, and reflectors used with lamps and burners.*" Patent dated Oct. 19, 1864.

This invention relates, first, to the socket-holder or support used with lamps and burners for receiving the glass or chimney. Glasses or chimneys vary in diameter, and frequently will not fit the socket, whence considerable inconvenience arises. The invention also relates to the support or frame for holding reflectors or shades at the upper part of the glasses or chimneys, which supports, as hitherto constructed, will not fit all chimneys nor all parts of one chimney.

The object of this invention is to adapt one socket-holder, support, or frame for different sizes or diameters of glass or chimney; and to effect this object, the socket-holder or support of glasses or chimneys and the ring or lower part of the frame or support of shades and reflectors are constructed extensible and contractible or adjustable as to size, so that the diameter or area of the holder, socket, support, or ring may be varied to fit glasses or chimneys of different diameters or sizes.

2633.—HYDE BATEMAN, of Barnes, in the co. of Surrey, surveyor, and EDWARD GOOCH GARRARD, of Vauxhall, in the same county, wine merchant, for "*Improvements in the construction of pumps.*" Patent dated Oct. 24, 1864.

This invention relates to that description of pump which is usually termed a rotary pump, and consists in the adaptation to the purposes of pumping or forcing of a modification of an improved construction of steam-engine for which letters patent (No. 672, dated March 18, 1864) were granted to the first-named patentee.

The improved pump consists of a circular annular chamber constructed of two castings with semi-circular grooves or spaces formed in them, so that when the two castings are brought together, a circular annular chamber is produced, in which works a disc or piston made water-tight by means of suitable metallic packing. This piston is attached to a hollow boss mounted on a central shaft, which passes through stuffing-boxes formed on the sides of the cylinder casing, at the central part of which there are water-chambers with which the supply and delivery-pipes of the pumps communicate. Spaces are cut out of each side of the hollow boss which carries the piston, and these spaces communicate in succession with the openings of the water-chamber as the piston moves round. Two transverse discs, mounted in suitable grooves or ways in which they can be moved in and out, are adapted to the annular chamber, and are worked by eccentrics as the piston moves round in the cylinder. These transverse discs act as stops to divide the cylinder into separate chambers or compartments, into one of which the water will rush behind the piston as it moves forward, while the water is expelled from the other compartment or from the front of the piston. In this way a lift or force pump is constructed which will act equally well in either direction and does not require a separate air-vessel.

2641.—EDWARD HENRY TAYLOR, of Padeswood, near Mold, in the co. of Flint, engineer, for "*Improved apparatus for drawing off or emptying the contents of casks, ships tanks, and other vessels containing petroleum, paraffin, and other matters or liquids; and also the application of similar apparatus for the supply and stoppage of air.*" Provisional protection only obtained. Dated Oct. 25, 1864.

In carrying out this invention it is proposed to fix a flange and tube by screws, rivets, or other means, to the end, side, or other part of the vessel, which tube projects into the interior of the vessel while the exterior is screwed as a nut. Into this screwed part of the tube he screws a tubular plug, open at the front and closed at the back, there being in the body of the plug near the back a number of perforations, and at the front end two or more notches or recesses. The end part of the discharge-tap or pipe is screwed to correspond with the interior of the tube fixed to the vessel, and its extreme end has two or more projections corresponding with the aforesaid notches in the plate, and when the contents of the vessel have to be withdrawn, the projections are entered into the notches, and the end of the tap or pipe screwed into the tube, and as the projections and notches move together, the plug is unscrewed from the tube, thereby allowing the perforations to be open to the contents of the vessel, which then escape through the interior of the plug to the tap or pipe. When the tap or pipe is required to be moved, it is unscrewed from the tube, and at the same time it turns the plug, and draws it into the tube and closes the perforations, so as to make the vessel perfectly tight, and thus prevent leakage. For supplying and shutting off air to the vessels vents are used formed in a similar manner, the pipe having the projections being connected to a valve or tap. Similar apparatus is also applicable to the mains of water and gas pipes.

2644.—WILLIAM CLARK, of 53, Cancery Lane, in the co. of Middlesex, for "*Improvements in rotary engines or apparatus, applicable also as a pump or blowing apparatus.*" A communication. Patent dated Oct. 25, 1864.

This invention relates to an improved rotary engine, which also serves as a pump or blowing-engine. The apparatus is furnished with a piston carried by a wheel forming one side of the steam-chamber or cylinder, and communicating motion to the driving-shaft; also with a slide-valve, which serves the double purpose of admitting steam into the cylinder and at the same forming a moveable button or abutment in the said cylinder, which double action of the slide is obtained simultaneously. These two principal parts are enclosed in a circular chamber forming the remaining portion of the cylindrical surface.

2673.—WILLIAM CORMACK, of 15, Little Moorfields, in the co. of Middlesex, chemist, for "*Improvements in the distillation or destructive distillation of solid matters or semi-solid matters capable of yielding fluids or gaseous hydrocarbons, or other products—such as pit coal, Boghead, or other bituminous coal or shale, peat, wood, asphaltes, tallow, lard, fats, and other solid or semi-solid matters—and in the machinery or apparatus employed therein.*" Patent dated Oct. 28, 1864.

The object of this invention is to obtain liquid hydrocarbons and other matters in an improved condition by means of the improved apparatus hereafter described, which facilitates the process of manufacture, and enables a considerably lower temperature to be used than has been hitherto employed. For this purpose the solid or semi-solid matters to be distilled are placed into retorts, ovens, or other vessels usually employed in their distillation, and they are heated externally in the usual manner; but instead of employing one heat for the separation of the oil, and another higher heat for its vaporization and expulsion, the lower heat only is used for the separation of the oil, and the oil is then expelled from the retort or other vessel by the introduction of a jet, stream, or current, of atmospheric air, or gas, or steam, singularly or combined, superheated or otherwise, either above or near the surface of such solid or semi-solid matters to be distilled, which system prevents the oil from being charred or deteriorated, and thereby enables an increased quantity and superior quality to be obtained.

The air, gases, or steam are not conveyed into the retorts or other vessels for the purpose of producing heat to effect distillation, as the heat for that purpose is solely obtained by fuel heat externally applied, the air, gases, or steam being only employed for the purpose of mechanically forcing at the last stage the liquid hydrocarbons or other matters when formed from the retorts.

A perforated pipe or pipes is or are placed in the interior of the retort or other vessel, which is afterwards hermetically sealed at the top. The gases formed during the distillation propel the liquid hydrocarbons or other products downwards into suitable receivers, and thus the products of distillation being confined within the retorts, ovens, or other vessels, become mainly the propelling agents of the oils or other products by the

downward distillation. Or, instead of one or more perforated pipes, circular grids may be employed, formed of iron rods or gas-tubing, extending from the top to the bottom of the retort.

The claims are—

1. The use of air, steam, gas, or gases, superheated or otherwise, as the propelling agents of the liquid hydrocarbons or other matters, as described.

2. The propulsion of the liquid hydrocarbons or other matters generated within the retort by the downward descent of their own gases of expansion and propulsion.

3. The use of ammoniacal gases generated within the retort, and before leaving which they become the propelling agents, chemically and otherwise, by carrying off the sulphur and other impurities from the coke.

4. The use and combination of air, steam, gas, or gases, when combined (not singly), superheated or otherwise, for freeing the coke of its impurities during the distillation, as described.

5. The use, construction, and application of the apparatus as described and illustrated in the drawings.

2674.—George Rydill, of Dewsbury, in the co. of York, for "*A new hydraulic engine and pump for obtaining a motive power, or giving power to hydraulic engines, or balance engines or pumps.*" Provisional protection only obtained. Dated Oct. 28, 1864.

This invention consists in making a hollow cylinder or sphere of cast-iron, or any other metal, and of any required strength or length, with an opening in the bottom, and one on the top to admit of a piston-rod of equal diameter passing through, with a stuffing-box at each end, or to each piston-rod is attached a weighted piston, or pistons, or plunger of metal, stones, &c. The cylinder or sphere is charged with water or any other liquid, according to the weight of the piston or plunger. Within the cylinder there is brought in contact with the water or other liquid, a hydraulic ram, force-pump, plunge-pump, lever, or screw, in order to give any required pressure to or upon the water in the cylinder, which causes the weighted piston or plunger inside the cylinder to be moved up or down with the application of a very small force.

2690.—Joseph Solomon, of Red Lion Square, in the co. of Middlesex, optician, and Alonzo Galord Grant, of Nottingham, photographer, for "*Improvements in lamps or apparatus for burning magnesium and other metallic substances.*" Patent dated Oct. 31, 1864.

The object of this invention is to feed forward in a constant and regular manner the wire which produces the light. As the light is produced by the combustion of the wire, and this latter gradually burns away with a certain and uniform speed, according to the thickness of the wire, the feeding forward of the wire in a regular manner to a given point, so as always to keep the spark or ignited end of the wire at the same spot, is a matter of great importance.

To effect this object the magnesium wire is wound upon a spool or spools, which are placed in a cylinder, mounted on a stand, on which is placed a box containing clockwork movement, which when in action draws the wire off the spool, and passes it through a tube, and between a pair of feeding rollers to a tubular holder, from the outer end of which it projects, and when lighted burns with an intensely brilliant light.

This spark or spot of light may be placed in the focus of a parabolic or other reflector, so that the light may be thrown forward in any desired direction. The reflector is enclosed in front by a case provided with a glass to protect it from currents of air. The whole of the apparatus is of an extremely portable character, and is provided with a handle whereby it may be carried or held in any position.

The improvement also consists in adapting to the break or stop mechanism of the clock-movement a wedge, which is introduced into the tube containing the break lever. By inserting this wedge above the break lever, the stop or break will be kept out of action when the clockwork is required to be in motion. When the clockwork is stopped, the wedge is to be withdrawn, and the break will stop the movement.

The next improvement consists in combining sodium, potassium, or other akaline metal with magnesium. This alloy will give a red but strong heat and light, and will greatly facilitate the ignition of the magnesium or other wire. To adapt this improvement, the alloy of sodium and magnesium is cut up into small pieces, and protected from the atmosphere by being coated over with varnish and then wrapped in tin foil. One of these pieces is attached to the end of the magnesium wire by being squeezed on it, and when it is required to ignite the wire, this may be done at once by applying thereto a lighted match.

2700.—Paul André Roger, of Paris, in the empire of France, gentleman, for "*An improved apparatus for preventing the extinction of lamps and similar apparatus.*" A communication. Patent dated Nov. 1, 1864.

This apparatus is intended for preventing the extinction of signal and other flames in lamps and similar apparatus by currents of air and sudden gusts of wind. It consists of a plate of metal placed above the opening of the chimney of the lamp or other apparatus, and carrying a rim or border corresponding to this opening. Above this rim or border is placed a disc or second plate, supported by a rod carrying a knife oscillating on two uprights fixed to the first plate, and a balance-weight, which may be regulated at will, so as to keep the cover slightly raised above the rim or border of the opening. The heat of the flame raises the cover and allows the vitiated air to escape, while any currents or gusts from without shut the cover down and prevent the flame being extinguished.

2702.—Isaac Schwartz, of Castle Street, Falcon Square, in the City of London, for "*Improvements in apparatus for lighting rooms and buildings.*" Patent dated Nov. 1, 1864.

For the purpose of this invention an oblong hole or opening is made in the ceiling of the room or building, and into the opening is fitted and fixed a reflector, formed of corrugated glass, with polished tin or other metal behind it. The reflector is in form a hollow truncated pyramid, with an oblong base, and the interior is the reflecting surface; it is so fixed that its lower edge or base comes flush with the ceiling in which it is fixed. With this reflector a long straight gas-burner is employed; it is placed midway between the sides of the reflector, and the burner is bored so that there may be numerous jets of flame along each of its sides.

The burner should be fixed below the level of the base of the pyramid. In place of this arrangement there is sometimes employed a reflector, the form of which is nearly a truncated cone, but its base is not truly circular, but a polygon of many sides, and the reflector is made up of as many pieces of corrugated glass and of metal as there are sides in the base. This reflector is used in combination with a ring burner, placed concentric with the base of the cone, and below the plane thereof. There is also combined with this reflector a second of similar form, but smaller, and with its reflecting surface on the exterior. It is inverted within the first, and its apex comes nearly down to the level of the burner, its base being on the level of the upper edge of the principal reflector. A passage, however, is left between the two for the escape of the products of combustion, and for the ventilation of the room or building.

In place of employing corrugated glass and flat sheet metal, corrugated metal and flat glass may be employed, or corrugated metal may be employed without glass.

Either of the above described forms of reflectors may be placed below the ceiling of the room or building, in place of being fitted into an opening therein.

2725.—Joseph Cutler, of Bowman's Place, Holloway, in the co. of Middlesex, for "*Improvements in the construction of overflow or waste pipes of cisterns, and in connexions applicable thereto and to other pipes.*" Provisional protection only obtained. Dated Nov. 3, 1864.

The object of this invention is to prevent the escape or return of effluvium from traps into the water of the cistern, as is now frequently the case, and to remove foul air from the closet, and also to afford more ready means of uniting or connecting the joints of pipes.

In carrying out this invention, it is proposed, instead of making the standing waste-pipe in the cistern a mere vertical tube open at top, to form it with a syphon or S-shaped head, whereby, on regulating the ball-tap so that when the water is on from the main it should just flow over and fill the trap or bent syphon head in the standing waste-tube, it would be impossible for any effluvium to escape through such tube and enter the cistern. As there is always foul air confined below the closet which escapes as soon as the handle is raised, it is proposed to remedy this by inserting a branch pipe in the overflow-pipe, and conveying it to a chimney, thus taking the effluvium up the chimney and out of the house.

The connexion is constructed as follows:—A tube, flanged at one end, is continued by a tube of less diameter, the end of which has a male thread cut thereon. If it be necessary to apply the connexion of a slate cistern to unite and attach the overflow or waste pipe, the tube is passed through the hole in the slate, the flange forming a seating. A washer should be placed under the flange. The tube or connexion has a second thread cut around its larger diameter, so that a nut and washer underneath the cistern may be screwed thereon to tighten and fix it in position. The upper portion of the overflow-pipe, or that which is in the cistern, is then screwed into the enlarged portion of the tube down to the internal washer, and the descending pipe below the base of the cistern is screwed or fixed on to the lower extremity of the connexion.

2734.—Frederick Yates, of Birmingham, in the co. of Warwick, engineer, for "*Improved apparatus for generating combustible gases.*" Patent dated Nov. 4, 1864.

It is known in practice that hitherto certain inconveniences have existed in working with bituminous as also with impure dry coal, or other sorts of impure fuel, which have been employed to create gases in closed generators, of the usual construction, under a blast of air. The object of the present invention is to remedy these defects, and the apparatus employed for the purpose consists of a chamber of any convenient horizontal section, and of a suitable height. At about 2 feet from the bottom of the chamber, and at any convenient part thereof, one or more tuyeres are placed capable of delivering a continuous stream, or thin sheet of air, into the chamber. These tuyeres it is preferred to place in pairs, about 12 inches apart, and at such an angle that they may blow upon the face of the fuel in the chamber at nearly right angles, so that the tuyeres would have an inclination to the horizon of about 45°, at about from 2½ to 4½ feet from the bottom of the fire-chamber, according to circumstances, and about 1 foot, reckoning from that end or side of the chamber in which the tuyeres are placed. Above the level of these tuyeres is placed a platform or arch, which may be either perforated or not. It may be made hollow, so as to contain water, or it may be made of refractory materials in the shape of a slab or flat arch, or it may be constructed of metal bars, or a solid plate, either curved or straight. The platform is inclined downwards towards the fire-bridge end, at an angle of from 35° to 40°. For certain fuels it may, in some cases, be found convenient if the platform be laid horizontally. In other cases, such as when anthracite or dry coal is used, this platform is omitted altogether, the omission being dependent upon the nature of the fuel employed. When the platform is dispensed with, an arch or wall of the required depth, and funnel-shaped towards the top, is placed across the fire-chamber, parallel to the fire-bridge, or its equivalent. This wall may be placed horizontally, about 1 foot back from the fire-bridge. The chamber is also sometimes divided perpendicularly, by means of a wall, into two compartments. This wall is carried to the top of the arch, or under the platform, when this is used, and two stoking-holes and two cleaning-out holes are provided, so that one compartment can be kept at work whilst the cinders and ashes are being taken out of the other. The top of the chamber is closed by an arch, and upon this or at the side is placed an air-tight feeding hopper, to prevent the escape of gas, both whilst at rest as well as during the time of feeding the generator. This hopper may be moved periodically, either automatically by machinery or by hand. Fire-bars may be placed at the bottom of the chamber, either horizontally or inclined upwards against the tuyeres, in which case a closed ash-pit will be required, and in case of very slow combustion, the well-known travelling endless fire-bar system could be employed.

2735.—Henry Anderson Gwynne, of 19, Hanover Terrace, Regent's Park, in the co. of Middlesex, engineer, for "*Improvements in the manufacture and construction of centrifugal pumps and parts connected therewith, parts of which improvements are applicable to other machinery.*" Patent dated Nov. 4, 1864.

This invention relates to an improved method of moulding parts of centrifugal pumps of the usual or other construction, which is also applicable to the moulding of like parts for machinery generally. This object is accomplished by the aid of one or more loose pieces or patterns. It also relates to the casting of the foot valve-box of centrifugal pumps in one piece, in lieu of two separate pieces joined together, and providing it with a door or opening, so that the surface whereon the valve rests can be planed, and the flap taken out without disturbing the box.

The invention further consists in the moulding of the connecting-pipes of centrifugal pumps and other short lengths of pipe by the aid of a tubular pattern, and loose pieces for the flanges when required; in a system or mode of moulding the various parts of centrifugal pumps and other portions of machinery from half patterns; in a peculiar construction and arrangement of centrifugal pump-cases and parts connected therewith; in the casting of the bed-plates of such pumps in one piece with the connecting-pipe; in the application and use in such pumps of a short length of pipe on the discharge side, provided with a moveable segment; in making the valve-seat of centrifugal pumps on the bed-plate; in the application and use in such pumps of a small air-pump worked from the spindle of the pump itself; and in constructing the cases of such pumps as are cast in one piece with a circular opening in one or both sides, for the removal of the disc.

2751.—William Thrift, of 20, Pennyfields, Poplar, in the co. of Middlesex, for "*An improved rotary engine, pump, or blast.*" Patent dated Nov. 7, 1864.

The improvements in this engine is the simplicity of its construction—a saving of steam, as it makes very nearly the whole of the revolution before it wastes any steam, and in full power the whole time of the revolution, so that when in action as a pump it throws a continual force of water, and when in action as a blast it blows a continual force of air.

The patentee claims as the novelty of his invention the principle of the fan working on the circumference of the said engine, and opening and shutting on hinges in the cylinder, by the aid of springs, to receive the action of the steam, and shutting in the stoppage blast in the cylinder; also a cone-shaped bearing for the shaft of the engine, and the principle of having parts of the said bearing moveable, the centre of the shaft solid, with springs let into the bearing, or shaft, or both, radiating from the centre, to act on a bearing, so as to keep a continual pressure towards the sides of the said bearing, that it may be steam-tight.

2757.—James Slack, of Chorlton Works, Manchester, for "*Improvements in filters and filtering apparatus.*" Provisional protection only obtained. Dated Nov. 7, 1864.

These improvements in filters and filtering apparatus consist in reversing and self-cleaning main-service filters or filtering apparatus for attaching directly to the house-service water-pipes, and they are intended to be formed, fitted, and operated in the following manner:—The vessel which forms the filter-case is closed at one end, and fitted with a water-tight closing cover at the other; or it may be a pipe or cylinder open at each end, having two water-tight closing covers. In the centre of this vessel is placed the filtering material, which is held in position by a perforated plate fixed above and below it, leaving spaces between the said perforated plates and the ends or covers for the water. Each chamber of the filter or filtering apparatus thus formed is fitted with an inlet-tap and junction-collar, so that the water from the main can be admitted to both chambers alternately. Both chambers are also fitted with draw-off taps, through which filtered and unfiltered water may be drawn at pleasure. By making the filter itself to move, and reverse end for end, one service-tap and one draw-off tap only are required. The unfiltered water in the latter case can be drawn directly from the main.

APPLICATIONS FOR LETTERS PATENT.

2020.—Adderley Sleigh, of 12, Upper Belgrave Place, Eaton Square, Middlesex, for "*Producing a rotary self-acting new motive power by the employment of buoyancy, gravity, and hydraulics through the agency of fluids, gas, and solids separately or combined.*" Aug. 4, 1865.

2021.—William Clark, of 53, Chancery Lane, London, engineer, for "*Improvements in apparatus applicable as a motive-power engine, a pump, or fluid-meter.*" A communication. Aug. 4, 1865.

2040.—Adolph Millochau, of the city and state of New York, U.S.A., for "*An improvement in stills for the distillation of petroleum and other oily substances.*" Aug. 5, 1865.

2043.—Adrienne Anastasie Foubert, of St. Heliers, Jersey, for "*Improvements in apparatus for regulating the passage or flow of steam, water, and other fluids.*" Aug. 7, 1865.

2055.—Thomas Goode Messenger, of High Street, Loughborough, in the co. of Leicester, hydraulic engineer, for "*A new portable machine or apparatus for the cutting of screw-threads on pipes or on solid materials, and for the cutting of pipes asunder.*" Aug. 8, 1865.

2094.—Henry Woodward, of Cannon Street, in the City of London, gas engineer, for "*Improvements in gas-burners.*" Aug. 12, 1865.

2095.—Henry Woodward, of Cannon Street, in the City of London, gas engineer, for "*Improvements in carburetting coal gas, and manufacturing artificial gas, and in the machinery or apparatus employed therein.*" Aug. 12, 1865.

2111.—James Billings, of Kentish Town, in the co. of Middlesex, accountant, for "*Improvements in ventilators*" Aug. 16, 1865.

2128.—Nicholas Charles Szerelmey, of 90, Belgrave Road, Pimlico, London, gentleman, for "*Improvements in the manufacture of paper-boards and pipes.*" Aug. 17, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1866.—John Paul Baugh Le Patourel, of 11, Garden Reach, Calcutta, for "*Improvements in ventilators.*" July 18, 1865.

1933.—Astley Paston Price, of 47, Lincoln's Inn Fields, London, consulting chemist, for "*Improvements in the manufacture of carbonate of ammonia, and in the utilization of the product obtained in such manufacture.*" A communication. July 25, 1865.

1940.—Samuel Lusty, of Walworth, Surrey, machinist, for "*Improvements in fluid-meters.*" July 26, 1865.

1958.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*An improved water-meter, which may be employed as a water, steam, or gas engine.*" A communication. July 28, 1865.

1980.—Alfred Vincent Newton, of 66, Chancery Lane, London, mechanical draughtsman, for "*An improvement in refining petroleum and other hydrocarbon oils.*" A communication. July 31, 1865.

2021.—William Clark, of 53, Chancery Lane, London, for "*Improvements in apparatus applicable as a motive-power engine, a pump, or fluid-meter.*" A communication. Aug. 4, 1865.

2055.—Thomas Goode Messenger, of High Street, Loughborough, in the co. of Leicester, hydraulic engineer, for "*A new portable machine or apparatus for the cutting of screw-threads on pipes or on solid materials, and for the cutting of pipes asunder*" Aug. 8, 1865.

NOTICES TO PROCEED.

951.—Robert Baynes, of Mansel Villas, Wimbledon, in the co. of Surrey, gentleman, for "*Improvements in suction and force pumps.*" April 4, 1865.

967.—Jean Isidore Darribet, of Dax, France, gentleman, for "*Improvements in seats for water-closets.*" April 5, 1865.

972.—Charles Esplin, of 32, Tyer Street, Lambeth, London, for "*Improvements in apparatus for regulating the supply of gas.*" April 5, 1865.

986.—Pierre Hugon, of Paris, engineer, for "*Certain improvements in gas-engines.*" April 6, 1865.

995.—Henry Edmonds, of Peel Lodge, Gosport, co. of Southampton, for "*Improvements in apparatus for lighting and ventilating ships, part of which is also applicable for producing fresh water at sea.*" April 7, 1865.

1818.—George Thomas Livesey, of the South Metropolitan Gas-Works, Old Kent Road, London, for "*Improvements in treating ammoniacal liquors for purifying gas and other purposes.*"—July 10, 1865.

1834.—Nathaniel Jenkins, of Boston, U.S.A., for "*Improvements in steam and water valves.*" July 11, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2165.—William Clark, "*Improvements in gas-burners.*" A communication. July 30, 1862.

2170.—Elijah Freeman Prentiss, "*Improvements in obtaining products from rock oil, coal, coal tar, and other like mineral substances, in a more or less pure and deodorized state, and in the apparatus to be used therefor, and which is also applicable to distillation in general.*" July 31, 1862.

2199.—William Clark, "*Improvements in the purification of water, and in apparatus employed therein.*" A communication. Aug. 5, 1862.

2212.—François Henry Marie Côme Damiens, "*Improvements in the means of lighting towns or other localities, and of ventilating, warming, and providing the same with water.*" Aug. 7, 1862.

2233.—Alexis Jean Moreau and Adolphe Ernest Ragon, "*Improvements in the mode of and apparatus for treating bituminous and carbonaceous substances, for the purpose of obtaining the various products, volatile, liquid, and solid, which they contain, and also in the treatment and application of such products.*" Aug. 9, 1862.

Legal Intelligence.

SOUTHWARK POLICE COURT.

MONDAY, AUG. 14.

(*Before Mr.* WOOLRYCH.)

Mr. Daintree, of the firm of Daintree and Co., dyers, &c., Dockhead, attended to ask assistance in putting a stop to an extensive system of swindling carried on, he believed, in all parts of London, especially among large consumers of gas.

The applicant said that he had a large establishment at Dockhead, and consumed a large quantity of gas. Some time ago great complaints were made against the gas companies and their meters, which were alleged to register too much against the consumer. In August last he was waited upon by a respectable-looking man, who said he was collector to the Metropolitan and Provincial Association for the Inspection of Gas Meters, 98, Goswell Street, E.C., that the association was established to protect the consumers of gas by properly inspecting meters, and thereby checking the gas companies, and that the annual subscription was £1. The so-called collector left a circular, and believing that it was genuine he paid a year's subscription in advance, and was handed a printed receipt. The man pretended to examine the meter, and left. The applicant, seeing nothing more of the parties, made inquiries among his neighbours, and found several had paid similar sums of money, and a fraud was suspected. In consequence of that he made inquiries and proceeded to 98, Goswell Street. He ascertained that some man took a room in that house in August last, but never occupied it or paid any rent, and had not been seen since. The applicant believed the signatures to the receipts were forgeries.

Mr. WOOLRYCH: Do you know where to find the parties, and have you ascertained whether there has been or is such an association as that described in existence?

Mr. DAINTREE replied in the negative, but he felt assured that unless something was done many other persons would be defrauded.

Mr. WOOLRYCH told him when he could gain all the necessary information, and the real names and addresses of the parties, he could have warrants.

SANITARY IMPROVEMENTS AT WOOLWICH.—Operations were commenced on Saturday in Bloxford Square, Woolwich, for the purpose of diverting part of the drainage of the town into the new southern outfall sewer. Woolwich is, therefore, the first parish that will be relieved of the sewage under the present improved system. The contract has been taken by Messrs. Hill and Keddall, the well-known contractors of London, at a cost of £10,000, and will be carried out under the experienced superintendence of Mr. J. Haughton and Mr. John Barnett, engineers to the Metropolitan Board of Works.

Miscellaneous News.

ASSOCIATION OF GAS MANAGERS FOR THE COUNTIES OF FIFE, KINROSS, PERTH, AND FORFAR.

The Fourth Annual General Meeting of this Association was held at the Salutation Hotel, Perth, on Wednesday, the 26th of July—Mr. THOMAS WHIMSTER, Perth Gas-Works, president of the association, in the chair.

After the annual financial report had been read by the secretary and treasurer (Mr. Mackenzie), and new members admitted, the following gentlemen were elected office-bearers for the year 1865-66—viz., Mr. William Proctor, Forfar, president; Mr. Watson, Stirling, vice-president; Mr. Mackenzie, Cupar, Fife, secretary and treasurer; Mr. Fraser, Inverkeithing, auditor; and Messrs. F. Whimster, Perth, R. Renton, Montrose, R. Gray, Dunfermline, and R. Brown, Arbroath, members of committee.

The CHAIRMAN said that, before submitting a correspondence which might prove of vital importance to the interests of the association, it might be useful to look for a few minutes at its present position and prospects. Three years ago this movement was inaugurated. We were not, perhaps, happy in the choice of a name. Modesty and prudence induced us simply to include the counties which were actually represented at that first meeting. Our purpose was to form a nucleus, around which all might gather, our humble name being one to which we were fairly entitled, and at which none could cavil. We thus circumscribed the field of our operations, in the hope that if successful in demonstrating that such an institution were practicable, one might be formed in Edinburgh or Glasgow by men of influence and ability sufficient to secure the co-operation of the profession throughout the country. Our aim was not a local, but a national association; we, therefore, purposely took a local name, that we might leave the national ground unoccupied for the natural leaders of such a movement. Upon the whole, we made a fair and very encouraging start, and, as the years have come and gone, we have been growing in strength. Our members at that first meeting numbered 20, our present roll of membership shows 34, giving an increase of 70 per cent. for the three years. Thus there does not appear to be any lack of vigorous health among us; the heart and elasticity of youth are evident. If we look at what has been already accomplished, no special pleading will be necessary to show that we have been successful. Two other associations have been the fruit of this one, and when we look at the papers read before the British Association, and the discussion arising out of them as reported in the JOURNAL OF GAS LIGHTING for last month, and especially that valuable paper by Dr. Letheby, on "The Present State of the Chemistry of Gas Lighting," we may, with complacency, say that the work goes forward bravely. Neither should we pass lightly over our own contributions to the general stock; they have been creditable to us, and particularly that masterly and lawyer-like paper on "The History of the Manufacture of Coal Oil," by Robert Aytoun, Esq., and the paper on the "Valuation and Taxation of Gas-Works," by William Fraser, Esq. We have not time to linger upon details, farther than hastily to point out the more prominent out-blossomings of our work; but, surely, these entitle us to say that gas managers throughout the country are indebted to those who inaugurated this movement, and that gas companies also are realizing benefit in a pecuniary sense to a very large extent. Our present position, then, is a most respectable and safe one, and should induce engineers and managers to join us, and gas companies to cheer us forward in the path of usefulness. Then, what are our prospects? We might answer briefly—pleasant and encouraging. But, more at length, there is a large field before us, almost unoccupied, untilled, and unsown, into which we may cast the seed of information and inquiry with the certainty of a rich return. The publication, in the JOURNAL OF GAS LIGHTING, of the papers, and the discussions arising out of them, would be the means of giving confidence and guidance to many who may have work thrown upon them, which they must accomplish without having the time and opportunity for inquiry and thorough preparation. This necessary information, all who have their hearts set on doing their work well must desire to have; for every manager can, at very small cost, have these journals beside him, and a reperusal of papers on the work which he may have on hand, may reproduce forgotten ideas of improvements and also of errors, at a time when they are most needed, and thus prevent mistakes and useless expenditure. Through these meetings you have also a safe and easy medium of publishing improvements, and securing your claim to them as your own invention, without incurring the cost and vexation of a patent, which is too often a lying *ignis fatuus*, luring to disappointment, if not to ruin. It is well known that, unless an invention be published, it may be patented by another, and the true inventor prevented from using his own invention. These associations are supplying an existing want; there is a demand for their produce, and the prospect before us is, to all appearance, honourable and permanent usefulness. But, after all, your prospects may be marred or improved by the decision to which you may come on a very delicate question. Your fair child, who made her *début* three years ago, has (as you know) attracted considerable notice, and, it would appear, won a heart. The fact is, I hold in my hand proposals of marriage from the Scottish Association; it will be for you to decide whether you prefer the single to the married state. Personally, I regard the union or amalmagation as the realization of one of our leading ideas and aims at the formation of this association, and trust that in considering it, one thing will be kept in view, and one thing supremely—*i. e.*, "What course will best secure the object aimed at in the origin of this movement?" The chairman then read the correspondence referred to, and expressed his grateful acknowledgment of the honour conferred upon him in his appointment to the chair of the association for the past year, and felt sure that they would not too critically scrutinize, but that they would accept of the *intent* of his humble efforts in discharging the duties of his office

The committee were empowered to negotiate with the Scottish Association of Gas Managers, and report to next general meeting.

The following papers were then read:—

ON THE DISTANCES WHICH GAS MAY ECONOMICALLY BE MADE TO TRAVEL.

By ROBERT AYTOUN, Esq.

The author stated that water companies take full advantage of the facilities afforded by the easy flow of liquids in pipes. They not only distribute water from their works to their customers by means of pipes, but bring it great distances from the source to their works by the same means. The water sent into Glasgow from Loch Katrine averages just now 23 million gallons a day, and weighs 100,000 tons. If it were brought in carts, it would cost £50,000 at least per day. Gas companies also avail themselves of the facilities afforded by pipes, but only for distribution. They have never, to any extent, employed pipes to bring the gaseous fluid to their works for the purpose of saving the expense of carriage. This is the more remarkable when it is considered that by doing so they would not only save the expense of carriage of the gas, but also that of the coke, which amounts to double the weight of the gas. Two reasons may be given for this. The first is that the earlier gas companies, particularly in England, looked to the sale of coke as the most profitable part of their business, and had no wish to adopt a system which would have given them gas at a less cost, but have deprived them of coke altogether. The second reason may be the rarity of the gas, which might lead to the belief that pipes for their conveyance would necessarily be so large as to be unprofitable in a pecuniary point of view. But, whatever be the cause, the fact is certain, that the plan of manufacturing gas at the collieries where the gas coal is raised, separating it from its impurities there, and then despatching it in pipes to the place of consumption, has never been examined with the attention it deserves.

The present time is well suited to enter into this examination, as there seems pretty generally a desire, especially in the metropolis, for good gas, in contradistinction to cheap gas. If once the Londoners should insist, as they are well entitled to do, upon having the *very best gas in the kingdom*, the whole system pursued by the metropolitan gas companies will have to be entirely altered. The Newcastle caking coal, with its valuable coke, will have to be abandoned for the best cannel, and it will then have to be taken into serious consideration whether it be not more economical to convey the pure gas from the collieries to the metropolis, by pipes laid the whole way, than to convey three times its weight in the shape of cannel coal by the ordinary means of conveyance.

As a present contribution to this investigation, the author submitted the following calculations, showing the cost of conveying from Scotland to London, a distance of 400 miles, the necessary quantity of cannel coal for lighting London, compared with the cost of conveying the gas produced from it the same distance in pipes.

London requires, during the longest night in December, 7 million cubic feet of its present gas (see Dr. Ure's "Dictionary of Arts and Manufactures," 1839, p. 569), or half this quantity—viz., 3½ millions of cannel gas. The pipes must consequently be capable of conveying the latter quantity of gas during 24 hours. Moreover, it consumes 1460 millions of cubic feet of its present gas during the year, and therefore would consume 730 million cubic feet of cannel gas, which may be considered the produce of 73,000 tons of cannel. The expense of conveying a ton of coal 400 miles by railway comes to 20s., at about a halfpenny per ton per mile, which is the lowest price hitherto charged by railways; but as they will have to compete in this case with shipping, we may suppose the rate lowered to 15s. per ton. The expense of carriage of these 73,000 tons would, therefore, amount to £54,750.

The next thing is to ascertain the dimensions of a pipe that will convey 3½ million cubic feet in 24 hours, which is the maximum quantity of gas consumed in the longest day in December. We get this by means of the formula for the flow of aëriform bodies in pipes, which will be found in Clegg's latest edition.

$$Q = 1350\, d^2 \sqrt{\frac{h\, d}{s\, l}}$$

By taking the diameter of the pipe, d=12 inches, and the pressure of the water, h=1332 inches, which is equivalent to a pressure of 48 lbs. on the square inch, we get Q=32,749 cubic feet per hour, or 785,976 in the 24 hours. As this gas is under a pressure of 4 atmospheres, it must be multiplied by 4 to get the number of cubic feet—viz., 3,143,904, which it will measure when it escapes into the gasholders. This is within a trifle of the maximum quantity required. It thus appears that a pipe of the very moderate diameter of 12 inches is quite sufficient for the conveyance of this large quantity of gas. This circumstance, in the author's opinion, has a most important bearing on the practicability of the scheme, in an economical point of view. Now for the per centage gained.

The weight of a 12-inch pipe is 2 cwt. per yard, 176 tons per mile, and 70,400 tons for 400 miles; this will cost, at £5 per ton, £352,000; add for laying, &c., £48,000; making in all, £400,000. The outlay of this capital would make an annual saving in the carriage of coals of £54,750, equivalent to a dividend of 13 per cent. on £400,000.

No estimate has been made of the steam power necessary to force the gas along the pipes, but it cannot be great, as the velocity of the gas within these pipes would not exceed 8 miles an hour; while we have experience of the velocity of common air in the pipe of the atmospheric railway, being maintained at 30 and 40 miles an hour without any great expenditure of power.

But the pipe system, observes the author, besides cheapening the conveyance of the best cannel gas, will enable London and distant towns to supply themselves with a rich gas from another mineral, which they never could get otherwise. The oil shales produce very rich gas, but not in sufficient quantity to make it profitable to cart them even to the gas-works in their immediate vicinity. But when once a branch pipe is led to these shales, their rich stores of gas will be at the command of the proprietors of these pipes. It would be well for the London gas companies to be made aware that there are many parts in Scotland where oil shales exist to the thickness of 30 or 40 feet. The new member for Linlithgowshire, Mr. M'Loggan, of Pumpherstone, is working shale for oil in an open quarry, which would be available to large gas-works, if they had a pipe to connect with them.

In connexion with rich shales he mentioned another mineral which would work harmoniously with them, if the system of pipes were to come into use. Certain cannels give a moderate quantity of gas of a feeble illuminating power, but which may be carburetted to a high degree by being mixed with rich gas. The Lochgelly and Cowdenbeath cannels are of this nature. They are so abundant that they could supply the consumption of London for upwards of 100 years. There is in the immediate neighbourhood of them a rich field of shale, belonging to the proprietors of Capledrai. The gas produced from the shale is fully equal to that produced from the Capledrai parrot; but as there are only 6000 cubic feet produced from the ton, it is rejected by the nearest gas-works. But if the system of pipes were in operation the rich gas of the shales might be mixed with the poor gas of the cannels, so as to raise the whole to the illuminating power required. It is needless to say that the subsequent travel of the two gases in company would have the happiest effect in promoting their union.

In conclusion, the author expressed his opinion that there was a sufficiency of cannel coal in various parts of the country to supply London and other large towns in England with gas of high illuminating power and great purity, such as is enjoyed universally in Scotland.

Several members made remarks on the smallness of the pipe and the enormous pressure to which the gas would be subjected, also that no notice was taken of leakage, &c.

The CHAIRMAN stated that nothing had been said about condensation by Mr. Aytoun, but ground had been broken in the investigation of a subject

of great interest, which would, no doubt, attract the attention of the engineers, who were more directly concerned, many of whom were men of great ability; and he had no doubt they would hear more of Mr. Aytoun's paper, which he trusted would be published.

The thanks of the meeting were given to Mr. Aytoun for his interesting paper.

GAS MAIN AND SERVICE PIPES.

By Mr. THOMAS WHIMSTER, Perth.

1. *Main-Pipes.*

By the term "street-mains," we understand the large leading pipes through which the gas is conducted underground from the gasholder along the streets which are to be lighted. They are generally made of cast-iron, in lengths of 6 feet, 9 feet, and 12 feet, varying in thickness of metal from a quarter to three-quarters of an inch. But main-pipes have been manufactured from other materials besides cast-iron—as sheet-iron, riveted and covered with bitumen, bitumenized paper, &c. This latter, as a material for main-pipes, and whose chief recommendation is lightness, has not been so successful as seems to have been expected. I say "seems," as it gave birth to a limited liability company in London, and also to an establishment in Hamburg for its manufacture. Pipes made of this material have been largely tested in Paris and elsewhere; but, from a paper read before the Institution of Engineers in Scotland, last March, which gave rise to a very interesting discussion, it appears that they have not yet proved satisfactory, and are not regarded with much confidence.

Cast-iron, as a material for main-pipes, still keeps its place as better, and in every way more suitable for its purpose, than any other yet tried; the only difficulty experienced with it being in the method of joining the lengths together. The original joint was what is commonly called the spigot and faucet joint. It is prepared with a plain bead at one end and a socket or faucet at the other. The spigot end of the pipe is placed within the socket of another, and the annular space between is filled to about half its depth—say 2 inches—with tarred gasket, caulked firmly in. The outer half is filled with soft lead, and caulked until it is perfectly gas tight. This joint when well made, and at a sufficient depth in the ground to be safe from violent disturbance, is all that can be desired. But to get such a joint properly made, it is necessary to excavate a large space in order to give the workman room to get freely round it. This is expensive and not always practicable, as other pipes, such as water-pipes, gas-pipes of competing companies, and even drains, are frequently found to be in the way. Also, hurry to get the work finished in a crowded street and prevent complaints of the obstruction of the traffic, rain falling in a deep pipe track and endangering the slipping in of the earth, besides other causes, may occur to complicate the matter. To overcome these difficulties, and, under all circumstances, to ensure that a joint, if made at all, shall be well made, inventors have devised many plans. One of the earliest of these was that of caulking white gasket into the inner end of the socket, then wrapping tarred gasket round the outer end, leaving a space between them to be filled up with a preparation of Russian tallow, which, not being liable to shrink in cooling, does not require caulking. Another, and very largely used plan, is what is known as the turned and bored joint. This joint is prepared by boring the faucit to a diameter slightly enlarging towards the outer end, and the spigot is turned to a conical shape to fit the faucet. The pipe thus prepared by the maker, requires from the pipe layer only the application of a little red lead paint to the spigot and faucet; the one is then placed within the other, and a few blows from a mallet drive it home. By this plan, the excavation of joint pits is partly dispensed with, and the work in the streets can be carried forward with much greater rapidity. This, however, can only be called a partial, not a complete remedy for the evils complained of, because when pipes have to be cut and T's used the joints have to be made gasket and lead. Also, as frequently happens, the pipes may not be turned true, and, in consequence, allow escape at the joint. To make provision for this, a groove or space is left inside at the front of the faucet, into which lead may be run and caulked to make the joint gas-tight. This is a great improvement, as it not only provides against a very troublesome contingency, but, by preserving this portion of the skin of the cast-iron whole inside the faucit, it adds very much to its strength, and also confines the strain occasioned by the blow of the mallet to the inner end of the faucet, which is its strongest part. If this provision is not made, when the joint is discovered to be imperfect, the pipe has to be withdrawn, the defective spigot cut off, and a gasket and a gasket and lead joint made instead. Also, if care be not taken to cease driving when the pipe is home, the faucet may be split; in this case two lengths of pipe have to be lifted, and a pipe lost or a thimble used. So that upon the whole, it is a doubtful question whether turning and boring be an easier and safer plan than the common spigot and faucet joint.

Other methods of jointing have been invented and patented which dispense altogether with the faucet. By one of these, the pipes have a bead cast on each end, and an encircling clasp, constructed in two or three pieces, with recesses corresponding to the beads on the ends of the pipes, is the means of connexion. By using a flexible wrapper or washer, this clasp is put on and screwed home with bolts and nuts. A drawing of one of this class is before you. Another recent invention was noticed with approval in the JOURNAL OF GAS LIGHTING for November, 1864, the improvement in which consists in having a ring of lead cast in the fore part of the faucet, and the spigot end, which is cast slightly tapering, is forced into it, producing the same effect as caulking. This is a combination of the advantages of both the spigot and faucet and turned and bored joints, which neither requires gasket nor red-lead paint, and also much less lead than the first-named joint. I should also think that with this joint a shortened pipe may be used, and made gas-tight by a little caulking. T's might also be prepared with it in the same manner as pipe lengths. This certainly seems to me to be the desideratum in cast-iron pipe-joints.

2. *Service-Pipes.*

By "service-pipe," we mean the small branch-pipe which conveys the gas from the street-main into the consumer's meter. Though service-pipes be small, their importance is very great, when their length and the number of joints required are taken into consideration; and, unless special care be bestowed upon this branch of a gas engineer's duties, the loss of gas by leakage will not be small. Generally, a main-pipe, when well laid, gives no more trouble. It is large, and, being deeply laid in the ground, not easily disturbed; but service-pipes are exposed to many disturbances, such as the renewal of pavement, making or cleaning branch drains from houses, laying down and repairing water service-pipes, and other causes. Also, being small, they are often carelessly laid down without a firm bed, and consequently sink, causing the joints to leak, though perhaps only a very little—so trifling, indeed, that no notice is taken of them unless the escaping gas find its way into some house, causing a complaint, attention to which is compelled; but, though singly these leakages be small and trifling, in the aggregate they are of great importance.

In this paper, only five different materials of which service-pipes are made will be noticed, of each of which I have had more or less experience, and these will be taken up in order, beginning with the least valuable. They are composition, cast-iron, tin, malleable iron, and lead.

Composition pipe is cheap, and can be laid down at less cost than any of the others, but its average duration in *Perth* soil is three years. I have known it, within that time, become like a shell of sandstone, which could not be handled without breaking; and, in one instance, even wholly disappear, only the wood-runs upon which it had been laid being found, so that it is evidently unsuitable as a material for underground service-pipes.

Cast-iron has been more largely used for underground service-pipes than any other material; it has the advantage of rigidity and considerable strength, so that it can be laid with a slight declivity towards the main, and, if proper supports be placed for it—say about 3 feet apart—it is quite secure, and, being in short pieces, it can easily be put into its place in the ground. It can also be cut to any length without requiring to be screwed or prepared in any way. Cast-iron pipes, which have been laid 15 or 20 years, are still good, and, although in some places so soft that they can easily be cut with a knife, might serve a few years longer if left undisturbed. The rigidity, however, of cast-iron makes it liable to be broken by the sinking of the ground or great pressure from above, and its numerous joints expose it to great leakage. Its having to be terminated with malleable iron, in order to a connexion with the tin pipe, makes it less durable, as the malleable iron is more readily destroyed by rust.

Tin has been very sparingly used for service-pipes, for the simple reason that it becomes expensive when made of the thickness necessary to render it strong enough to resist the beating in of the earth above it. Tin, if pure, is very durable, pipes which have been in the ground 40 years, not manifesting any serious deterioration.

Malleable iron, next to cast-iron, has been most generally used for service-pipes. It is more perishable than cast-iron, being readily oxidized when laid in an open or porous soil, and especially where street surface water, running over causeway, laid on sand, has constant access to it; nevertheless, it has many recommendations. In general it has only two joints—viz., its connexion with the street-main at one end, and with the tin pipe at the other; and there is very little risk of leakage at either, as the strength and size of the main-pipe protect it, and it is not liable to be broken. In laying down it requires no street choffer nor melted lead, also fewer tools, and can be laid down more quickly than cast-iron. If well prepared by painting, and tarred over in the ground, and not less than ½-inch bore, of medium thickness of metal, it will last 15 years in ordinary ground or street soil; and where it is exposed to street surface water, it can, at small extra cost, be laid in a wood-run and covered with clay, as shown.

Lead, like tin, has not been much used for service-pipes. Regarded cursorily, it seems unsuitable. It is soft, expensive, and requires skilled labour. But, if looked at carefully, it will, perhaps, be found to be the best material for service-pipes. It is now some years since it occurred to me that it was so, but, unwilling to introduce a novelty which might have to be abandoned, and taught by experience that new plans bring out new difficulties and troubles, it was left over, until my opinion as to its suitability was confirmed by finding in the report of the Paris Gas Company that the low per centage of leakage in one of their districts was attributed to the use of lead service-pipes; so that my using it was no longer an experiment, but only the adoption of a plan which had been tried and approved of in a quarter where the results of experiments can be thoroughly relied upon. With the object of dispensing with skilled labour in the use of lead service-pipes, I have provided a strong brass half-coupling and coupling ring. The end of the coupling is screwed, by preference, the same diameter and pitch of screw as malleable iron tube, so that only one set of taps is required for all kinds of service-pipes. This screw has a shoulder one-quarter of an inch larger in diameter than the screw; the other end is fitted with a screwed ring, the back opening of which is the same size as the outside diameter of the lead pipe for which it is to be used. The neck between the screws is made hexagonal, so that a screw-key or spanner can be used to screw it home. The ring is slipped on to the lead pipe, the end of which is then laid over outwards, in such a manner as to form a collar or flange large enough to fill the screwed part of the ring, which is drawn forward upon the flange; the flange, with a leather washer, is then drawn against the face of the half-coupling by the ring, and a perfectly gas-tight joint is formed. The pipe is laid in the ground in a dry larch wood-run, half an inch by three inches, extending from the main-pipe to the wall of the house, and covered by a board of the same size. This prevents it from sinking off the level, preserves it from being crushed by the beating down of the earth over it, and protects it from the blow of a pick or spade. By this method it can be laid from the main-pipe to the meter by any man who can drill and tap a hole in cast-iron, and if the lead be pure, which can easily be secured, it may almost be said that it is not subject to decay.

We now come to the relative cost, in estimating which suppose the average length from the main-pipe into the meter to be 17 feet, so that two whole lengths of cast-iron pipe may be used without any loss by cutting. To lay a cast-iron service-pipe as above, two men will be required for seven hours and a gasfitter for one and a half hour, whereas two men will lay a lead service-pipe in five hours, without the aid of a gasfitter. The cost of laying down a three-quarter inch cast-iron service, 17 feet long, as above, will be as follows, viz.:—

	s.	d.
1 branch faucet fitted with screw, complete	0	11
9 feet of ¾-inch cast-iron pipe	2	2
1 foot of ¾-inch malleable iron tube	0	3
1¾-inch brass cap and coupling for conecting tin pipe	1	6
7 feet of ¾-inch tin pipe, at 5½d.	3	2½
2 lbs. of lead, 4d. Rope yarn, 4d.	0	8
Coals and wood for choffer	0	2
Men's time	4	10
Total	13s.	8½d.

The laying down of a ¾-inch malleable iron service-pipe, 17 feet long, as above, will cost as follows, viz.:—

1¾-inch brass connecting coupling for main	2s.	0d.
11 feet of ¾-inch malleable iron tube	2	9
1¾-inch brass cap and coupling for joining tin pipe	1	6
6 feet of ¾-inch tin pipe, at 5½d.	2	9
Men's time	3	6
Total	12s.	6d.

The laying down of a ¾-inch lead service-pipe, 17 feet long, as above, will cost as follows, viz.:—

1¾-inch brass connecting coupling	2s. 0d.
17 feet of ¾-inch lead pipe, at 5 lbs. per yard—4½d. per foot .	5 11
22 feet of larch boards, at ¼d. per foot	0 5½
Men's time	3 0
Total	11s. 4½d.

It thus appears, from these estimates, that taking only first cost into account, malleable iron is 8·8 per cent. cheaper than cast iron, and lead is 17 per cent. cheaper than cast iron.

As before stated, cast iron will last 20 years, malleable iron 15 years, and the deterioration of lead in 20 years is equal to 13 per cent. of its original value; new pipe being 23s. per cwt., and old lead 20s. per cwt. These relative values will perhaps be more distinctly seen in a tabulated form, as under:—

Relative Value of Cast Iron, Malleable Iron, and Lead Service-Pipes—Cast Iron being unity.

	Value, taking into account only First Cost.	Value, taking into account First Cost and Durability.
Cast Iron	1	1
Malleable Iron	1·096	·824
Lead	1·205	9·278

In this table, leakage is not taken into account, because it cannot be estimated accurately as first cost and durability can; but as it is even more important than the other two combined, it must necessarily be regarded as the principal consideration in estimating the value of service-pipes. It is evident that lead pipe will not leak, unless cut by some instrument, which cannot be done without the fact being known to some one who is likely to report it. Malleable iron is only liable to leak at the end of, say, 15 years, and even then very slightly; and attention is likely to be called to it before much gas be lost, because the leakage from a malleable iron pipe is so small to begin with that perhaps 100 feet of gas will not be lost in twelve months. But if cast iron be broken by the sinking of the ground, or perhaps by the beating down of the causeway when the pipe is newly laid, 100 feet of gas may be lost in 24 hours; and the broken pipe can only be repaired by the use of a thimble, which, by increasing the number of joints, adds to the risk of leakage. Another consideration, though of small value, is that in the laying down of cast-iron pipes, more than double the quantity of gas is unavoidably lost than in the laying down of either malleable iron or lead pipes.

Thus the conclusion to which these calculations and considerations lead is that lead for underground service-pipes, in ordinary cases, is not only cheaper in the first cost and *very* much more durable, but the great object which gas engineers must ever have in view—*i.e.*, the reduction of the per centage of gas lost by leakage—is to a large extent secured.

The paper was illustrated by drawings and samples, a short discussion on which was followed by a vote of thanks to the author for his thoroughly practical paper.

THE COMMERCIAL ANALYSIS OF COAL.

By Mr. Robert Gray, Dunfermline.

The modes for carrying out the analysis of coal are well described in various scientific works, and doubtless many of you are conversant with them; but to those members who have not such books in their possession, and who have not the privilege of a laboratory to work out experiments, I trust this subject will prove both interesting and instructive.

Every gas manufacturer ought to be possessed of that amount of knowledge which will enable him to make an analytical investigation into the different kinds of coal; by such means he will be able to ascertain for himself a knowledge of the various constituents of coal, and to determine the quantity of gas that may be produced from each kind, the amount of sulphur present, the heating powers of the coke, and the nature of the ash.

We find that, as soon as a geological examination of a portion of the earth has established the existence of coal in a locality, the first thing necessary to be done is to find the exact position, and also the accessibility of the coal. An exploration is made by the miner to determine this most important point by the operation called "borning."

From this process of probing into the bowels of the earth, small quantities of coal are brought to the surface and submitted for analysis, and from the results of the chemical test, the commercial value of the substance is ascertained. This, then, is another great advantage derived from having a test for the commercial value of coal.

While we admire the labours of the chemist, we must not lose sight of the labours of the geologist. Previous to the acquirement of the knowledge of geology, much fossil wealth was overlooked, and a useless expenditure of money was often made without any satisfactory result. The science of geology has, therefore, rendered most essential service to the miner in saving money and preventing fruitless research for coal.

In commencing a chemical analysis of coal, the chemist generally takes the specific gravity first, and a convenient way of determining it is to employ a piece of coal weighing from 400 to 500 grains; this is attached by a hair or slender thread to one pan of the balance, and accurately weighed. When the weight is carefully ascertained, the suspended piece of coal is then allowed to dip into a vessel of water; the weight it loses by being weighed in water is carefully noted, and by dividing the former weight by the loss sustained, the result is its specific gravity compared with that of water.

I may mention that no character of a body is more frequently referred to by the chemist than to its specific gravity. Many precautions and careful manipulations are, therefore, necessary in the determination of the specific gravity of liquids and elastic fluids; the knowledge required to lead to success must, therefore, be learned from works on natural philosophy, and the rules put into practice by experiment.

Having ascertained the specific gravity of the coal, the next step in the process of analysis is to determine the quantities of volatile matter and of coke. For this purpose a small iron crucible with cover, the cover to have a small hole in it, may be used, or a Berlin ware crucible with a loose fitting cover, will answer the purpose equally well. I prefer the latter.

Having reduced the coal to small pieces—say about the size of a pea—carefully weigh 100 grains and introduce this quantity into the crucible, put on the cover and apply heat until gas ceases to be evolved. The crucible and contents are allowed to cool, and the coal taken out and weighed. The amount lost by the distillation is the weight of the volatile ingredients of the coal.

The proportion of coke and volatile matters being now determined, the next step is to ascertain the combustible or heating powers of the coke. To do this I prefer using a piece of platinum foil, turning up the sides and making it in the form of a shallow dish, apply heat with a Bunsen burner until the whole of the carbon is consumed and carried away, leaving only the incombustible residue or ash behind, which must then be weighed with care.

To determine the nature of the ash its colour is noted, and a few simple tests applied, but as it is not of much importance to the gas manufacturer I will not trespass on your time by going into details.

The quantity of sulphur in the coal is next to be ascertained, but I regret to state that this experiment cannot be performed in the room in which we are now assembled. It is an experiment that requires to be wrought out in the laboratory, and to merely mention the mode by which it is done without showing you the experiment in detail, would only be a waste of time without any satisfactory result. I would, therefore, refer you to the pamphlet, entitled "The Chemistry of Gas Lighting," where you will find a formula that will enable you carry out this experiment successfully.

In all chemical investigations there is a considerable amount of patience and perseverance required, and the student must not be disheartened at the repeated failures he will meet with in his researches. When accurate results are attained, the satisfaction he will enjoy at the success of his efforts will amply compensate for the time and labour he has bestowed upon them.

The thanks of the meeting were heartily accorded to Mr. Gray for his paper.

At the close of the meeting, the members of the association and their friends dined together in the Salutation Hotel, Mr. Whimster doing the duties of the chair, and Mr. Proctor officiating as croupier.

Dr. Whitmore's Report on the Quality of the Water supplied in St. Marylebone, in July, 1865:—

	Total Solid Matter in degrees or grains per Imperial gallon.		Organic Matter in degrees or grains per Imperial gallon.		Ammonia.
	July, 1864. 0°	July, 1865. 0°	July, 1864. 0°	July, 1865. 0°	0°
Distilled Water . . .					
West Middlesex water	....	15·92	....	1·84	—
Grand Junction water	....	18·40	....	2·00	—
Pump at end of Harewood Pl., Oxford St.	....	31·92	....	7·93	·636
	Dec., 1864.		Dec., 1864.		
Pump at Market St. .	60·4	85·12	5·44	7·60	·424

Dr. Whitmore's Report on the Quality of the Gas supplied in St. Marylebone, in July, 1865:—

	Illuminating Power in Sperm Candles.			Mean Pressure in 10ths of an inch.	
	*Mean of 26 Observations.	Highest.	Lowest.	Highest.	Lowest.
Imperial Company's gas	13·53	14·30	12·76	20·72	9·1
Chartered Co.'s common gas . .	12·48	13·62	11·75	31·27	13·0
Chartered Co.'s cannel gas . . .	20·79	22·65	18·93	29·87	12·72

* Each observation consists of 10 readings of the photometer.

The average illuminating power of the Imperial gas during the month has been a candle and a half above the standard. Four times it exceeded 14 candles, and twenty times it was over 13 candles; the pressure has been much improved, and, as regards purity, it has been better than usual. The common gas of the Chartered Company has averaged half a candle above the standard—once only it was below the standard; the pressure has been always good, frequently high. The cannel gas has been twice below the standard; on three occasions it exceeded 22 candles; nine times it was above 21 candles. Occasionally during the month the ammonia has been in excess of the quantity usually found in it. At no period of the month has the sulphur in either of the gases reached the quantity permitted by law.

New Gas and Water Company at Cowpen Quay, Blyth.—A company, called the Croft Gas and Water Company, Limited, has been formed for supplying the inhabitants of Cowpen Quay, Waterloo, and the neighbourhood, with gas and water, particularly the latter. The capital is £10,000, in 2000 shares of £5 each. The directors, in their prospectus just issued, state that they have obtained from the proprietor of the Bebside estate sufficient ground, at a moderate price, whereon to erect works adjoining the river Blyth, a little above Bedlington Bridge, where an unlimited supply of good water can at all times be had. Permission has been got from the trustees of the turnpike to lay pipes by the side of the road leading from Bebside to Cowpen Quay and Waterloo, by which payments for way-leave to land proprietors will be saved. The estimated cost of putting up a pumping-engine, making reservoirs, laying pipes, &c., is about £4000. The directors have every confidence in a sufficient revenue to pay a remunerative interest on the investment, after deducting working expenses. Considering the almost total want of water in the place at present, a plentiful supply will be a great boon to the inhabitants generally, whose chief dependence is upon the primitive water-carts. Messrs. Croft and Thornton have promised to take a good number of shares, and to give the project every support, and we have no doubt but the general public will do so likewise. It is not intended to proceed with the gas-works at present.

Coal Statistics of the United Kingdom.—There were at work during 1864 no fewer than 3268 collieries in Great Britain and Ireland. In 1853 there appear to have been only 2397. The quantity of coal raised, sold, and used during last year from all these works was 92,787,873 tons.

Portuguese International Exhibition.—The last intelligence from Oporto states that the Crystal Palace building is fast approaching completion, and, as the committee have decided on the inauguration taking place in September, all the details of the work are being hurried on with the utmost alacrity. The whole building is to be brilliantly lighted up with gas, the contract for which has been entrusted to Messrs. J. Defries and Sons, the chandelier manufacturers, of 147, Hounsditch, London. Although they have before them but a very short time to complete their contract for this gigantic work, they have undertaken the responsibility with the usual determination which has characterized the firm on all occasions of like emergency. The great facilities which Messrs. Defries command for the execution of the largest contracts, and the numerous staff of skilled workmen and artisans in their employment, guarantee the successful termination of any undertaking which the firm have pledged their responsibility to accomplish.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	5 0 0	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	5 0 0	5 5 0
10000	5	Do., second issue	3 0 0	5 0 0	3 to 3¼
10000	5	Do., third issue .	1 0 0	5 0 0	1¼ to 1½
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29½ to 30
6200	20	Do., new . . . . (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	30 0 0	10 0 0	76 15 0
6000	50	Do.	30 0 0	10 0 0	48 to 48½
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7½ to 7¾
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow(L) Colonial & General	5 0 0	7 0 0	2¾ to 3¼
17490	25	*Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G.&W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	10 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
3000	10	Do., preference .	10 0 0	6 0 0	12½ to 13

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	35 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13 10 0
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre,& Nantes.)	5 0 0	10 0 0	6 15 0
20000	10	*Great Central Gas Consumers* . .	10 0 0	10 0 0	16 10 0
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	83 0 0
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	92½ to 93½
3000	40	*Independent* . . .	40 0 0	10 0 0	65 to 67
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6886	50	*London*	50 0 0	10 0 0	79 10 0
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781	-	Do., 1st pref. sk		6 0 0	
11828	-	Do., 2nd pref. sk		5 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
12000	5	Malta & Medit.(L.)	5 0 0	2 10 0	
150000	1	Oriental, Calcutta	1 0 0	8 0 0	1½ to 1¾
10000	5	Ottoman (Limited)	5 0 0		4 to 4¼
10000	10	Pará (Limited) . .	10 0 0	5 0 0	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	33¼ to 33¾
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do.(capit.profits)		5 0 0	
5000	20	*Ratcliff* . . . . . Rio de Janeiro (L).	20 0 0	10 0 0	35 to 37
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15¾ to 16
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . . (Dublin&Limerick)	50 0 0	4 12 0	35 5 0
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16¾ to 16¾
10000	10	Do., B shares.	5 0 0	10 0 0	8 10 0
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.). . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	3 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2¼ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ⅜ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Toes, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s.6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton).	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	23 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s.3d
Cork	9s. 3d. to 9 9
Dover, Folkestone, and Ramsgate	6 9
Dublin	10s. 6d. to 10 6
Exeter Quay	8 6
Ipswich	5 9
London (from Leith)	8 6
London (Pool)	6s. 3d. to 6 6
Lowestoft and Yarmouth	4 6
Portsmouth and Southampton	7 6
Plymouth	7s. 9d. to 8 3
Shoreham	7 0
Whitstable	6 6
Weymouth	7 9

Foreign.—Per Keel:—

Barcelona	£24 10
Bordeaux	£13. to 15 10
Boulogne and Calais	£8. to 8 5
Cadiz	17 0
Copenhagen	£8. 10s. to 9 0
Genoa	22 10
Hamburg	£8 10s. to 8 15
Havre de Grace	9 10
Leghorn	22 0
Lisbon	16 0
Rotterdam	£8. to 8 5
Stettin	10 5
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Natle. Fire-bks., p. 1000,	£2.10s. to £2 15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 6
Ingham's ditto (at Wortley), p. 1000..	2 15 0
Fire-clay Retorts, p. ft. run,	5s.6d. to 0 7 0
Tough Cake Copper, p. ton	86 0 0
English Pig Lead, p. ton	19 5 0
Welsh Bar Iron (in London), p. ton ..	7 15 0
Foreign Spelter, p. ton	22 0 5
English Block Tin, p. ton	94 0 0
Banca, p. ton	94 10 0
Tarred Rope Yarn, p. cwt.	1 0 0

Advertisements.

TO BE SOLD, a Set of 4 Cast-iron DRY-LIME PURIFIERS, each 7 ft. 3 in. by 6 ft. 3 in., and 3 ft. 9 in. deep, with complete hydraulic centre valve, and revolving lifting-crane for the covers. Three tiers of cast perforated shelves in each, and 8-in. connexions.

The above purifiers are in good condition, and sold in consequence of larger having been substituted.

The Company have also for sale at a low price, in very good condition, a 3-horse TABLE STEAM-ENGINE.

The whole may be inspected and particulars known on application to Mr. GIFFORD, Gas Company's Office, CAMBRIDGE.

July, 1865.

CONTRACT FOR WORKS.

PHŒNIX GAS COMPANY.

THE Directors are prepared to receive TENDERS for the erection of a RETORT-HOUSE and PURIFYING HOUSE at their Vauxhall Station; and also of a COAL-STORE at their Station at Bankside. Drawings and specifications of the same can be seen at the ENGINEER'S OFFICE, BANKSIDE, after the 18th inst.

Tenders, separate for brickwork and ironwork, to be forwarded (marked "Tender for Retort-House," on the cover) on or before Tuesday, the 29th inst.

The Directors do not bind themselves to accept the lowest or any tender.

70, Bankside, S.E., Aug. 16, 1865.

GAS Manufacturing Superintendent wanted, to superintend the works generally of a Company near London. Must be thoroughly competent to give instructions for the setting of retorts on the most approved principles; and able generally to give drawings and specifications for new work, and thoroughly understand the business of gas making in all its parts.

Apply, by letter, to A. B., care of Bowles and Sons, Printers, George Street, Mansion House, E.C., LONDON.

TO IRON-FOUNDERS AND OTHERS.

THE undersigned is ready to receive TENDERS for a GASHOLDER and Wrought-Iron RETORT-HOUSE ROOF, for the Port Adelaide Gas-Works.

Plans and specifications can be had on application to J. C. LANYON, 58, Gresham House, Old Broad Street, LONDON.

A BARGAIN.

TO BE SOLD, Cheap, a first-class MODEL of a GAS-WORK, well finished, and containing everything really necessary to a gas-work of large magnitude.

For particulars and price, apply to Mr. W. BELTON, Wellington, SALOP.

TO GAS APPARATUS FITTERS, ERECTORS, AND MAIN-LAYERS.

WANTED, several Men, both for England and abroad.

GEO. BOWER, St. Neots, HUNTS.

WANTED, by the Bath Gaslight and Coke Company, a CLERK used to the office work of a gas company.

Salary to commence at £100 per annum.

Address the Secretary of the Company, with testimonials.

Bath, Aug. 7, 1865.

TO GAS COMPANIES.

THE Advertiser is in want of a Situation as INSPECTOR or MANAGER of a Country Gas-Work. No objection to go abroad. Fourteen years' experience.

Address GAS INSPECTOR, 17, Ryder's Court, Leicester Square, LONDON, W.

WANTED, a second-hand Purifier, or two, about 8 ft. by 8 ft., and 4 ft. deep, with lifting apparatus.

Terms, &c., to Mr. W. MORLEY, Gas-Works, Carshalton, SURREY.

CONTENTS.

Notes upon Passing Events:— PAGE

The Cholera Panic 653
Another projected Attempt to lay an Atlantic Telegraph 653
Strike of Labourers in the Metropolitan Building Trade 654
Decadence of Industrial Exhibitions. 654
Death of Mr. Appold, F.R.S. 654

Circular to Gas Companies:—

Table of Prices charged for Gas by the Metropolitan Gas Companies in 1864 655
Meeting of the Liverpool United Gas Company, and Reduction in the Price of Gas 656
Proceedings of the Leamington Local Board with reference to the Supply of Gas to the Street-Lamps 656
Refusal of the Overseers of East Barnet to levy a Rate for Public Lights, under the 3rd and 4th Will. IV. c. 90 656
Professor Anderson's Report on the Action of Sulphide of Ammonium on the Bisulphide of Carbon in Coal Gas. 656

Communicated Articles:—

Experiments on the Action of the Sulphides of Ammonium upon the Bisulphide of Carbon and Sulphuretted Hydrocarbons in Coal Gas . 657

Register of New Patents:—

Burgess, C. T.—Centrifugal Pumps 660
Garton, C.—Obtaining Power from Liquids 660
Manning, J. A.—Collection and Treatment of Night-Soil 660
Mennons, M. A. F.—Globes or Shades. 660
Esplin, C.—Apparatus for Regulating the Supply of Gas 660
Gedge, W. E.—Pumps 660
Applications for Letters Patent 661
Grants of Provisional Protection 661
Notices to Proceed 661
Patents which have become Void 661

Legal Intelligence:—

Barnet Petty Sessions 661

Miscellaneous News:—

Meeting of the Ratcliff Gas Company 664
Dr. Hillier's Report on the Gas supplied by the Imperial Gas Company to the Vestry of St. Pancras during the months of July and August 665
Meeting of the Western Gas Company. 666
Meeting of the Liverpool Gas Company 667
South Essex Water-Works Company 668
The Illuminations at Portsmouth 668
Ventilation 668

Share List of Metropolitan Gas Companies 669
Price Current 669

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, September 19, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 5, 1865.

Notes upon Passing Events.

If fright will produce the cholera, we shall soon have it amongst us. The sanitary doctors and their echoes are working steadily away at prophecies of evils about to come. If this artificial agitation puts parish officials on their mettle it will not do any great harm, for those who can be frightened to death are not worth much to the community. With respect to the doctors, it is very natural that a class so hard worked and so ill paid should eagerly seize any excuse for creating new posts, undefined duties, and certain salaries, for which medical men only will be eligible. At the meeting the other day, where the remnant of the medical tail of the Board of Health were the chief speakers, the only distinct proposition was to obtain an anti-cholera commission, in which Mr. Edwin Chadwick was to be one, and of course chief commissioner. But this modest proposal has met with no response out of the self-elected parliament of doctors, and for the best of reasons—the public do not see what such a roving commission could do, except get up a case for more salaried doctors. Under the present laws, every town of any importance is provided with very complete sanitary machinery, with medical officers of health and inspectors of nuisances acting under the engineer or surveyor of the district. There is no reason to doubt that these officers will do their duty. In the great towns of Liverpool and Manchester, the engineers are exceedingly active and well supported by their respective municipal councils. The City of London may be taken as a model of municipal activity in the way of cleansing. In the first place, London is admirably sewered, and every sewer that is known is kept in working order. Certain ignorant persons, who assume airs of great technical knowledge, talk sometimes of "sewers of deposit." Indeed, we have heard lately of a thousand miles of sewers of deposit. But this is a mere figure of speech—it is one of Mr. Chadwick's facts. There are no street sewers in the metropolis where the sewage does not pass away regularly in the 24 hours, except those which are at present locked up by high water on the Thames, and these, under the main drainage arrangements, will shortly be cleared by steam pumping. Wherever there is any reason to suspect accumulation of refuse, hand power following regular inspection is employed. Indeed it is not exaggeration to assert that the underground avenues and arteries of London are more carefully kept than the above-ground. There are, of course, in ancient London some houses the details of the drainage of which are unknown. But as a whole there is nothing to be compared to the completeness with which the sewerage of the metropolis, and especially of the City, has been executed, repaired, restored, and supervised. It must also be remembered that, although for comfort and decency's sake there can be only one opinion about the necessity of complete sewer arrangement, there is no evidence that anybody has ever been injured by merely nasty smells. The surgeon of the Thames Police has given in evidence that not one of the men under his charge living on the Thames during its foulest season suffered from the diseases akin to cholera.

But besides attention to sewers, there is the preternaturally active Dr. Letheby and his brother officers of health in the City of London, with a large staff of inspectors of nuisances, and an army with spades, brooms, lime-wash, brushes, and disinfectors, carrying on a perpetual war against garbage, foul smells, dust-heaps, over-crowded lodging-houses, and the dirty habits of the Arabs of metropolitan society. In a word, the machinery for cleanliness cannot be improved by Act of Parliament. If in all districts the sanitary arrangements affecting the poorer classes are as well carried out as in the City of London, there would be little room for complaint. But such a reform can only be carried out by the force of public opinion, and the public opinion in favour of cleanliness is growing steadily downwards. Baths are an institution of modern date amongst the English of the middle class; tubbing has only come in within the last twenty years. There are still plenty of little squires in the West who shiver at the idea of cold water all over, unless on a warm summer's day. But the working classes are encouraged to wash by the increase of baths and washhouses—one of the few charities which cannot possibly do any harm. It has often occurred to us that it would add much to the utility of these bath and washhouse establishments if tickets were issued by the dozen, entitling the bearer to a bath or a turn at the clothes-washing department, as the case might be, with a piece of soap. Such an arrangement would afford good-natured people the means of doing a great amount of good at a moderate expense. A ticket for soup may be abused, but a ticket for a bath or an hour's washing of clothes might be the foundation of other more important reforms. The police-magistrates, who are the unthanked instruments of a great deal of real, useful charity, could advantageously distribute every year some thousands of these clean bills of health.

The failure of the Atlantic telegraph cable has not disheartened the original promoters, and, to the credit of the country,

a third attempt has been already organized by the Telegraph Maintenance Company. The first was a mere stock-jobbing adventure. The second was a fair experiment, and afforded to this rigid country a nice excuse for gambling in an ocean lottery. The speculators have gained a plentiful but valuable crop of experience, and have every chance in favour of successfully laying the cable. They are as deliberate in this third attempt as they were hasty in the first. Whether the cable will hold one month, or six months, or twelve months, after it has been laid, is as much a matter of doubt as ever. In the meantime, the French newspapers, full of admiration at the "at it again" spirit of the English speculators, have been describing as a novelty a project for a line of short sea lengths by Spain, Africa, Brazil, and on to New Orleans, which was published in detail by Mr. Window six or seven years ago—not only proposed, but worked out, after at least one journey to Brazil and several to Spain. It is odd that none of the English newspapers have remembered a prospectus very widely circulated at the time.

The strike of the skilled mechanics of the building trade has been followed by a still more remarkable one—that of the labourers; the first in our recollection in which mere labour has been in a position to demand and obtain an immediate concession of increased wages. The labourers have not yet obtained all they asked, but half has been offered them, and the masters are quite willing to give all to picked men. This is a very remarkable state of things following on railway extension, steam navigation, extensive active colonization, and free trade. It is but a few years since the over-population of the kingdom was an accepted fact amongst eminent economists and statesmen. Emigration was then encouraged, with the view of setting the surplus population to work on virgin soils. There were persons, not without influence, who considered that the country was in danger of being devoured by pauperism. Whatever foundation there may have been for these terrors, they have certainly disappeared in England and Scotland. In every branch of trade there is a shortness of hands. Ireland's turn must come when the hodmen and mortar mixers can afford to strike; for emigration to England is now almost as profitable as to America. Success is the only justification of a strike; failure is almost a crime. This is illustrated by the result of the Staffordshire ironworkers strike. Experience showed that the masters could not afford to pay what was asked. The men were so far ruined that those who had cottages or furniture or savings lost all, and it is calculated that the men past forty will never recover the effects of this disastrous struggle. The other day the famous Mr. Potter, one of the prime ministers of trades unions, received something like a vote of censure for his management of the Staffordshire affair at the hands of the London trades. The building trade obtained at once an offer of increased wages, because houses are wanted and they cannot be imported; but the ironworkers are not beyond the reach of competition. Belgium, with cheaper labour, can not only compete, but undersell us in certain important branches. We have before us a list of prices issued by the London agents of the Regissa Iron-Works, at Huy, in Belgium, printed in English, with English weights, measures, and money, and in this bars are offered in London at £7. 5s., when the quotations for Welsh bars is £7. 15s. Not only do a large share of the orders for rails required for Russian, Spanish, and Italian lines go to Belgium, but recently the same country has received an order for the pumping-engines required by a company which has undertaken to drain the water-logged pits of the Tyne. These facts will not long escape the attention of the working classes interested, in these days of universal daily newspaper reading.

Decidedly exhibitions of manufactures are ceasing to amuse the public. In spite of fine phrases, the Dublin Exhibition is a failure. The West London has caused a loss of some 50 per cent. to the guarantors; East London has not been much more fortunate; while North-East London, opened by the Lord Chancellor and the Lord Mayor, has presented the curiosity of a bazaar without customers or even visitors. The success of the working men's exhibitions last year was a sort of "fluke," resting entirely on sentimental grounds. The sixpenny public refuse to pay a second time for exhibitions which merely repeat, the shop-windows of the district. In the provinces, where trades are more sharply defined, exhibitions may be more useful, and as amusements are less plentiful, they may be more profitable. What with free parks, music-halls, and joint-stock expeditions by rail and van to the suburbs, from Hampton Court to Epping Forest, there is some difficulty in finding a new amusement for the London mechanic pure and simple. Exhibitions are not very amusing, and if he wants to be instructed, there are the picture-galleries, and Professor Owen's stuffed animals, and Mr. Cole's curiosities. In the summer-time, the Zoological Gardens, at 6d., will beat any scientific lecturer. Talking of the South Kensington Museum, the managers seem most omnivorous in their tastes; beginning with art applied to manufactures, they have succeeded in forming a partnership with horticulture, and now are intent on calling in the assistance of music, and setting up a great concert-room alongside the Horticultural Gardens. A committee of the Society of Arts has been sitting too, to inquire into the condition of the Royal Academy of Music, and make out a case for Government assistance to that decaying, if not bankrupt association. The Commissioners of the South Kensington Estate, propose to remove the Academy from Hanover Square to a vacant spot alongside of the Cole "Boilers." The professors examined seem all well inclined to take a grant of Government money, but do not see the advantage of moving from the inside to the outside of the circle where their paying pupils and customers reside.

Music is undoubtedly a very charming amusement, for which the public are very willing to pay when they get it, just as they pay for pictures, or furniture, or Yorkshire pies, or any other luxuries; but, considering that the public do get all they want in the shape of music for high and low, that works on music and of music are plentiful and cheap, that there are two great opera-houses in London, and concert-rooms without end—considering that first-class musicians and vocalists are paid better than leading barristers, and almost as well as bishops—considering that music is taught in almost every parish school, and that voluntary associations for vocal and band music thrive throughout the kingdom—it is difficult to understand what more is required, unless it is to provide a handsome house, with dignity and appropriate salaries for a small batch of unappreciated English composers. Close neighbours of the Royal Academy of Music are the Royal Agricultural Society and the Zoological Society, which, like all the other scientific societies of London, receive nothing from Government funds. The Royal Academy of Painters receives nothing but a house rent-free, and seems not likely to enjoy even that long. Nothing less than a vote of several thousands per annum would satisfy the fanatics of the musical world. These views are set out with complete candour by M. Manuel Garcia in a paper sent in to the Musical Education Committee of the Society of Arts. He says: "The self-supporting Royal Academy of Music is a "failure. For an establishment of this kind to be able to "compete with the Paris *Conservatoire*, it must have a larger "area, and at least one theatre at its disposal. It must have "funds enough to offer a free education to some hundreds of "students, and by thus addressing itself to the masses it might "meet with some highly gifted natures, by whose influence, "after severe and solid preparation, the tone of English theatres "might be raised, and national art finally issue from that state "of subservience to foreign talent from which it has so long "suffered, though not unjustly. Such an object is well worth "the expenditure of some thousands per annum"! That is to say, if we will consent to spend a few thousands per annum on educating Tom, Dick, and Harry, Molly, Jenny, and Julia, for singers, players, and composers, we may stand a chance of getting music home-brewed like our beer, instead of imported like our claret. If very successful, we may get an English opera equal, say, to "Traviata." But why not a Royal Academy of Dancing, too? We shall await with some curiosity the report of the committee on this mass of ridiculous evidence. A proposition for a national establishment for growing pine-apples, in opposition to the excellent imported fruit sold at one penny a slice by costermongers, would be about as sensible. Let those who like music—and fortunately most people do—pay for it in their own way: a penny to an organ-grinder; a shilling to the excellent concerts at St. James's Hall; or half a guinea for more expensive entertainments at opera-house or concert-room.

We note with regret the death of Mr. Appold, so well known in engineering circles as an ingenious amateur mechanic; one who, had he been dependent for his bread in his early years on his mechanical skill, would have held a high rank as an inventor and constructor. As, however, he was fully and profitably employed in a good trade—skin-dyeing—his talents were chiefly devoted to purposes of amusement.

He earned the right of associating with the leading members of the Institution of Civil Engineers, and was, we rather think, one of the honorary officers of that distinguished body. His name first came prominently before the public as the inventor of the great centrifugal pumping-machine at the International Exhibition of 1851. It was impossible to visit the Glass Palace without hearing the pleasant continual gush of this great water-engine. Not being patented and in the hands of any one with an interest in pushing its use, this economical and powerful apparatus did not at first receive all the patronage it deserved. It was employed in draining Whittlesea Mere, and also, we believe, in some Dutch reclamations. Mr. Appold was frequently employed as a judge in the mechanical department of the Royal Agricultural Society, and had a share in devising the paying-out apparatus for the Atlantic cable. He made the first voyage to America in the *Great Eastern;* and, during a tour in the United States, measured the depth of the river from the suspension-bridge over the Falls of Niagara, to the extreme disgust of some romancing Yankees, who had assured him most positively that the river at that point was unfathomable! Mr. Appold was a man of singular energy, and always ready to spend time and money in a mechanical experiment. His house was a perfect store of mechanical contrivances. For instance, say that you were invited to dinner on an autumn evening, and conducted to the drawing-room just before the day closed, at the moment when the first jet of the glass chandelier was lighted, a slight whirring sound was heard, and shutters rolled from the walls and closed the windows, presenting, instead of the usual wood, large plate-glass mirrors. When dinner was announced the dining-room doors opened and closed automatically for the guests, and in the same way opened and closed for each servant who brought in a dish. Opposite Mr. Appold, during dinner, was a sort of thermometer, in the form of a metal serpent, which by its curls indicated the rise or fall of the temperature of the room. Under his feet was a pedal communicating with an air-pump worked by the steam-engine of his factory. As the gas burned, the fire blazed, the guests increased in number, the host watched the snake, and by the unseen application of his foot introduced a supply of fresh air, first carefully washed from London blacks, and thus maintained, in a by no means lofty room, no matter how numerous the guests, a constantly agreeable temperature. Besides these, there were numerous other contrivances equally ingenious and useful. The plans for ventilating his stables are well worth study, and Mr. Appold's self-acting carriage-step was particularly ingenious. Mr. Appold realized an ample income by dyeing skins by a secret process, which it is to be hoped will not disappear with him, as it was superior to anything known in the trade. If the advice of the *Times* and Lord Stanley be taken, and the Patent Law repealed, we shall have all the chemical trades based on secrets, and the corruption of workmen to steal the secrets reduced to a system.

Circular to Gas Companies.

It has been suggested to us that the tabular statement of the operations of the metropolitan gas companies for the year 1864, inserted in our last number, is liable to misapprehension, owing to the omission of the price charged by each company. To make the information more complete, we subjoin the following table of the prices charged to private consumers during the year, with and without meter-rents :—

Chartered.—Common gas, 4s. 6d. per 1000 feet.		With meter-rent, except in the C. of London.
Cannel gas, 6s.	„ „	
City of London.—Com. gas, 4s. 6d.	„ „	Without meter-rent.
Cannel gas, 6s.	„ „	
Commercial.—Common gas, 4s. 6d.	„ „	.. Ditto.
Equitable.—Common gas, 4s. 6d.	„ „	With meter-rent.
Cannel gas, 6s.	„ „	
Great Central.—Com. gas, 4s. 6d.	„ „	Without meter-rent.
Imperial.—Common gas, 4s. 6d.	„ „	.. With meter-rent.
Independent.—Common gas, 4s.	„ „	.. Ditto.
London.—Com. gas, 4s., 4s. 6d., and 5s.	„ „	Ditto.
Cannel gas, 6s.	„ „	
Phœnix.—Com. gas, 4s. 3d. and 4s. 9d.	„ „	Without meter-rent.
Ratcliff.—Common gas, 4s. 6d.	„ „	Ditto, except to a few consumers.
S. Metrop.—Com. gas, 3s. 8d. and 4s. per 1000 feet		Without meter-rent.
Surrey Cons.—Common gas, 4s. 6d.	„ „	.. Ditto.
Western.—Cannel gas, 6s.	„ „	.. With meter-rent.

The Independent Company reduced their price to 3s. 9d. per 1000 feet at Lady-day last, and have announced a further reduction to 3s. 4d., to take effect from Michaelmas next; the Imperial Company reduced their price, in July last, to 4s.; and most of the other metropolitan companies have promised reductions at various periods.

A more satisfactory report to the shareholders of any gas company was seldom presented than that of the directors of the Liverpool United Gaslight Company at their general half-yearly meeting on the 23rd ult. That company have for several years stood pre-eminent as supplying cannel gas of the best quality at a lower price than common gas could be obtained in most towns in the kingdom, and the shareholders have, at the same time, received the full amount of 10 per cent. allowed by Parliament. Frequent reductions have been made in the price during the past three years, and at the recent meeting the directors recommended a further reduction of 2d. per 1000 feet from the 1st of July last, thus making the price of cannel gas, to consumers within the borough, 3s., and in the out-townships, 3s. 4d. per 1000 feet. This reduction is the more gratifying as it is made immediately after a somewhat vexatious opposition, during the last session of Parliament, to the Act granting the company power to increase their capital and extend their works; that opposition having been founded on the allegation that if the capital of the company were increased there would be no further reduction in the price of gas. Even the opponents of the Bill admitted that the affairs of the company were well managed, and no attempt was made to reduce the maximum price of 4s. 6d. which the company have power to charge. The directors have shown on this as on former occasions that the power entrusted to them will not be abused; and at the meeting, the earliest opportunity was taken to bring into effect the power, which the recent Act affords to the proprietors, of increasing the remuneration of the directors. The continued reduction in the price of gas and the maintenance of the prescribed dividend attest the ability with which the undertaking is conducted and the efficiency of the Gas-Works Clauses Act, when properly applied, to protect the public. The gas consumers, as was well observed at the meeting, are thus made really partners in the concern, for they have a direct interest in its success. The directors well deserve the praise that was bestowed on them, but it must not be forgotten that the prosperous state of the Liverpool United Gaslight Company is mainly due to the able management of Mr. A. King, who has brought his scientific acquirements to bear successfully on his thorough practical knowledge as an engineer. The total consumption of gas supplied by the company has reached the enormous quantity of 1250 million feet per annum.

The Leamington Local Board, in their vigorous opposition to the Bill of the Leamington Gas Company, last session, availed themselves of the services of Mr. Flintoff and Mr. Hedley, and succeeded in introducing, with the concurrence of the gas company, various regulations respecting public lighting, among which were provisions that the price of gas supplied to the public lamps in the borough and within half a mile of it should be charged 6d. per 1000 feet less than to private consumers, that the quantity of gas consumed should be estimated by partial meter indication, and that the company should light, extinguish, clean, and repair for 13s. per lamp. The local board have, since the passing of the Act, apparently dispensed with the services of Messrs. Flintoff and Hedley, and have applied to Mr. Hughes to carry the provisions for public lighting into effect. At the last meeting of the board, according to the report of the proceedings in a local paper, it was stated that their clerk had been instructed to have an interview with Mr. Hughes on the subject, and from whom he had received a report, which was read. In that report Mr. Hughes stated that, in his opinion, a very considerable economy would result from employing meters for the public lamps; that he had found by careful calculation that the number of hours gas was consumed in the lamps, in accordance with the existing agreement made in April, 1861, was 3000 hours for each lamp per annum; and that, at the rate of 3s. 6d. per 1000 feet, the cost per lamp would not exceed £2. 5s., provided the

Board undertook the lighting, extinguishing, and repairs, which he strongly recommended, experience having taught him that it might be done for 8s. or 10s. per lamp. He further recommended the Board to purchase new lamp-posts, unless the present ones could be bought from the company at a very low price. The regulators now fixed to the lamps he considered radically bad, and he stated that he should be happy to submit to the Board the apparatus which, on his recommendation, has been adopted at Reading, and "which has now "been working satisfactorily for two years." He alluded to several towns, including Birmingham and Nottingham, where the average meter system has been adopted, though he admits that in some of those towns the system has not yielded satisfactory results, "owing to constant quarrels with the gas "company, because no proper means had been adopted, as "now insisted on by Parliament, for ensuring uniformity of "consumption between the metered and unmetered lamps; on "the other hand," he said, "where the double tap has been "adopted for that purpose, as at Worthing, Reading, and "Bolton, the results have been eminently satisfactory." The case of Reading is several times referred to in the report, and it is more than once stated that the Local Board of that town formerly paid by contract for 4 feet an hour per lamp, whereas the consumption by meter has been reduced to 2½ feet. There are, however, Mr. Hughes admits, many precautions to be taken in carrying into effect the arrangements for burning by meter in a satisfactory manner, so as "to produce uniformity between "the metered and unmetered lamps, and to create, as far as "possible, an amicable feeling; or, at all events, not to pro-"mote a hostile feeling on the part of the gas company." Mr. Hughes stated, in conclusion, that he was prepared with specimens of a proper regulating apparatus which had been adopted in other towns; and that if it were the pleasure of the Board to appoint him to carry out their object, he would endeavour to arrange the various points with the engineer or manager of the gas company. In a private letter to the clerk, Mr. Hughes offered to undertake the supervision of carrying out his suggestions during twelve months for £100, with the aid of an assistant at the cost of 30s. or 40s. a week; and the Board accepted the offer.

The assertion by Mr. Hughes, that the system adopted at Reading has been working satisfactorily for two years, is a direct misstatement of fact. During the first half year that the plan of average meter indication was attempted to be introduced, the irregularities in the registrations of the meters were so great that they were all removed, and the Local Board desired to return to the contract system, and would have done so had they been able to agree with the company as to price. The meters were at last brought to register more satisfactorily, but the alleged economy has been effected by diminishing the amount of light and the hours of lighting to such an extent that the lamps give only a faint glimmer, and for the purpose of illumination are altogether ineffective, while during part of the night there is total darkness. The public lighting of Reading is, in fact, a disgrace to the town, and the saving in the quantity of gas paid for is no equivalent to the diminution in the degree of illumination. The attempt to introduce the Reading system of public lighting at Birmingham and Nottingham, to which Mr. Hughes refers in his report, has not succeeded. It is satisfactory to find from Mr. Hughes's report, that his experience has at length taught him the impolicy, at least, of promoting a hostile feeling on the part of gas companies; and we hope that his future practice will be regulated by the wisdom gained by experience, for, hitherto, his object has seemed to be to excite dissension between gas companies and gas consumers wherever he has presented himself. The persistence in the introduction of the double tap is not, however, calculated to produce an amicable feeling in gas companies. He has not yet succeeded in convincing any gas company that his double tap is "a proper regulating apparatus," or suitable "for securing uniformity of consumption between "the metered and unmetered lamps," within the meaning of the provision introduced in some recent gas Acts; nor has he succeeded in inducing his employers, the lighting authorities, to call on the Quarter Sessions to solve the difficulty. We trust that the Leamington Gas Company, with the experience of Reading before them, will firmly refuse their consent to the adoption of the double tap in that town, and will adhere to the self-acting pressure-regulator now in use, or such a modification of it as may add to its efficiency.

In the absence of any specially constituted authority having power to enter into contracts for public lighting or to make rates for the payment of the cost, the cumbersome machinery of the 3rd and 4th William IV., cap. 90, is often resorted to for the purpose of providing public lamps and of entering into contracts for the supply of gas. According to the provisions of that Act, the churchwardens of any parish ar required, on the requisition of three ratepayers, to call a meeting to determine whether the provisions of the Act should be adopted. In the month of October last year a requisition to that effect, signed by twelve ratepayers, was presented to the churchwardens of East Barnet, who accordingly called a meeting, at which resolutions were passed, without dissent, for the appointment of three inspectors to carry the Act into operation in that parish. An arrangement was made by them with the owners of the gas-works for erecting and lighting public lamps, and an order was afterwards made by the inspectors on the overseers to levy the sum of £200 for payment of the amount of the contract. The overseers, however, refused to make a rate for the purpose, alleging that it would be illegal. The question was heard before the magistrates in petty sessions on the 21st ult., and many ingenious arguments were advanced by the legal gentlemen engaged on behalf of the inspectors and of the overseers, for and against the legality of the proceedings. It was objected, on the part of the overseers, in the first place, that the requisition and the notice for calling the meeting did not correspond, and that the parishioners might have supposed from the latter that the object of the meeting was only to consider the propriety of lighting the parish with gas by voluntary contributions, and not by a compulsory rate. The legality of the appointment of one of the inspectors was also disputed; and it was further objected, that the requisite majority for the adoption of the Act, of two-thirds of the ratepayers present, had not been sufficiently ascertained. It appeared from the occasional remarks of the magistrates that they inclined to think the requisite formalities had not been complied with, but they adjourned their decision until yesterday, when they dismissed the summons. The owners and occupiers of agricultural property are generally opposed to the adoption of the Act, for they are otherwise heavily taxed, and derive comparatively little benefit from the public lighting of small towns and villages with gas.

The interesting communications of Professor Anderson, of Queen's College, Birmingham, on the action of sulphide of ammonium on the bisulphide of carbon and sulphurous hydrocarbons in coal gas—of which we insert a continuation in our present number—appear to solve the question of the possibility of entirely purifying gas from bisulphide of carbon—so far, at least, as laboratory experiments can solve the question. The means by which he has succeeded in completely purifying coal gas from sulphur in any form is by repeated and copious washing with sulphide of ammonium. That method was first suggested by M. Ellissen, in his joint report with Mr. Barlow, in June, 1864, on the sulphur compounds in the purified gas supplied in the City of London, and which suggestion has been since approved by Dr. Letheby and Mr. Hawksley. Professor Anderson states that he succeeded in reducing the quantity of sulphur from 12·40 grains to 3·83 grains per 100 feet of gas, by transmitting it three times through sulphide of ammonium, and that when the gas contained 13·22 grains of sulphur in 100 feet, the whole was absorbed by passing it four times through the liquid. The crude gas liquor contains sulphide of ammonium, and when so employed it becomes more valuable after each operation. The question that yet remains to be solved is, whether these repeated washings will diminish the illuminating power of the gas.

Some misapprehension has, we are informed, arisen in consequence of the *interest* paid out of capital by some companies during construction, and *dividends* proper, paid out of revenue, not being distinguished in our share list of metropolitan gas companies. Without this information, the anomaly of the City of Moscow gas shares with a dividend of 7 per cent. being quoted at 40 per cent. discount, appears inexplicable to the uninitiated. We have, therefore, in order to distinguish such shares from those on which the dividends are paid out of revenue, added the word "interest" after the rate paid.

Communicated Article.

(*All articles inserted under this head being copyright, the right of reproduction or translation is reserved.*)

EXPERIMENTS ON THE ACTION OF THE SULPHIDES OF AMMONIUM UPON THE BISULPHIDE OF CARBON AND SULPHURETTED HYDROCARBONS IN COAL GAS.

By Alfred George Anderson, Esq.,
Professor of Chemistry in Queen's College, Birmingham.

(*Continued from page* 570.)

The small iron retort, which has been alluded to before as capable of working a charge of 6000 grains of coal, was in the next place heated to full redness, and three-fourths of a pound (5250 grains) of ordinary coal, in pieces the size of small nuts, was rapidly thrown into it, and then its cover was immediately luted on. Three-quarters of a pound of this sort of coal will usually afford somewhat exceeding 2½ cubic feet of gas, if care be taken to promptly convey it into the retort previously brought to a bright red heat; nevertheless, we cannot, by an operation conducted in this way, expect to obtain the full amount of gas obtainable from the charge, on account of the large proportion of tar always produced in an experiment made upon so small a scale, and the necessity which exists for the removal of the retort from the fire, for the purpose of introducing the charge, during a short time. From this cause the temperature becomes much reduced, a considerable quantity of tarry matters are unavoidably generated, and distilled over into the first receiver ere the temperature has again become sufficiently high to convert these into gaseous matters before expulsion from the retort in that form.

The outlet-tube of this retort first led into a two-necked Woolfe's bottle, containing a little water, under the surface of which it projected about half an inch. The exit-tube of this first vessel was next joined to a second empty Woolfe's bottle, standing in cold water. What was intended by employing this second receiver was, to effect, as much as possible, the further condensation of tarry matters, which, it has been experienced, are very often conveyed an unexpected distance through the condensing and purifying apparatus, unless some considerable care is exercised to effect their thorough deposition by such means in the first arrangements of the apparatus. In this way much embarrassment and annoyance may be avoided, after considerable labour in preparing an experiment, from occasional stoppages occurring in the condensing and purifying bottles, causing large leakage, and like sources of error, seriously affecting the results otherwise to be arrived at with very uniform accuracy. We may then connect the outlet-tube of this second condensing Woolfe's bottle with another of hydrated sesquioxide of iron and sawdust, without any likelihood of its becoming choked up during the continuance of the distillation. It is only necessary that the connecting-tube passing into this bottle be carried within a quarter of an inch of the bottom of this bottle; the blackening of the oxide by the impure sulphuretted gas may be allowed to progress until within 1 inch of the surface, yet the purified gas emerging from it will be found quite free from any trace of sulphuretted hydrogen, showing, in a striking manner, the remarkable, but now familiar action of chemical affinity developed by contact between hydrated sesquioxide of iron and that gas. With an arrangement of apparatus of this construction, we may observe with ease most of the phenomena incidental to the destructive distillation of coal. It now remains to describe what further was done in arriving at the result aimed at, which has rendered necessary the description given thus far.

The outlet-tube of the Woolfe's bottle, charged with the sesquioxide and sawdust, was then joined to the series of five U-tubes, containing pieces of pumice, each of which was supplied with sulphide of ammonium, well saturated, as before described, with hydrosulphuric acid, poured in to the height of 2 inches above the lowest inside level of each tube. At the outlet *h*, shown in the drawing at page 569 of this volume of the Journal of Gas Lighting, an improvement in this and subsequent experiments has been effected by joining to it one more capacious U-tube, to retain occasional portions of sulphide, which at times, being conveyed by the current of gas through the tube series, would finally accumulate in the end tube *n*, and then inconveniently pass over into the last vessel interposed between the tube series and gasometer F, and which, it will be remembered, was filled with sesquioxide of iron and sawdust, to absorb any sulphuretted hydrogen which would otherwise be, without doubt, evolved from the ammoniacal sulphide, and carried into the gasometer.

The distillation was continued until no more gas was generated in the retort, the cessation being at once proved by the non-passage of gas through the sulphide of ammonium in the U-tubes. The flow of the gas by thus directly transmitting it through these was at times somewhat rapid, and we shall see afterwards that well-regulated and moderately slow transit is most essential in order to effect very perfect absorption of the hydrocarbon compounds of sulphur of any coal gas.

This distillation had been performed in the evening, and the gas collected in the gasometer F was allowed to remain there until next morning. Then all that was in excess of 2½ cubic feet, the thermometer marking 64° Fahr.* was let out by the tap G, and the sulphur of the 2½ cubic feet was then determined by the method of burning in contact with the vapour of ammonia, but with some modifications in the construction of the apparatus very generally employed, which it is proper to describe here.

It is very well known that the apparatus described by Dr. Letheby is not without certain defects when brought into requisition for this purpose.

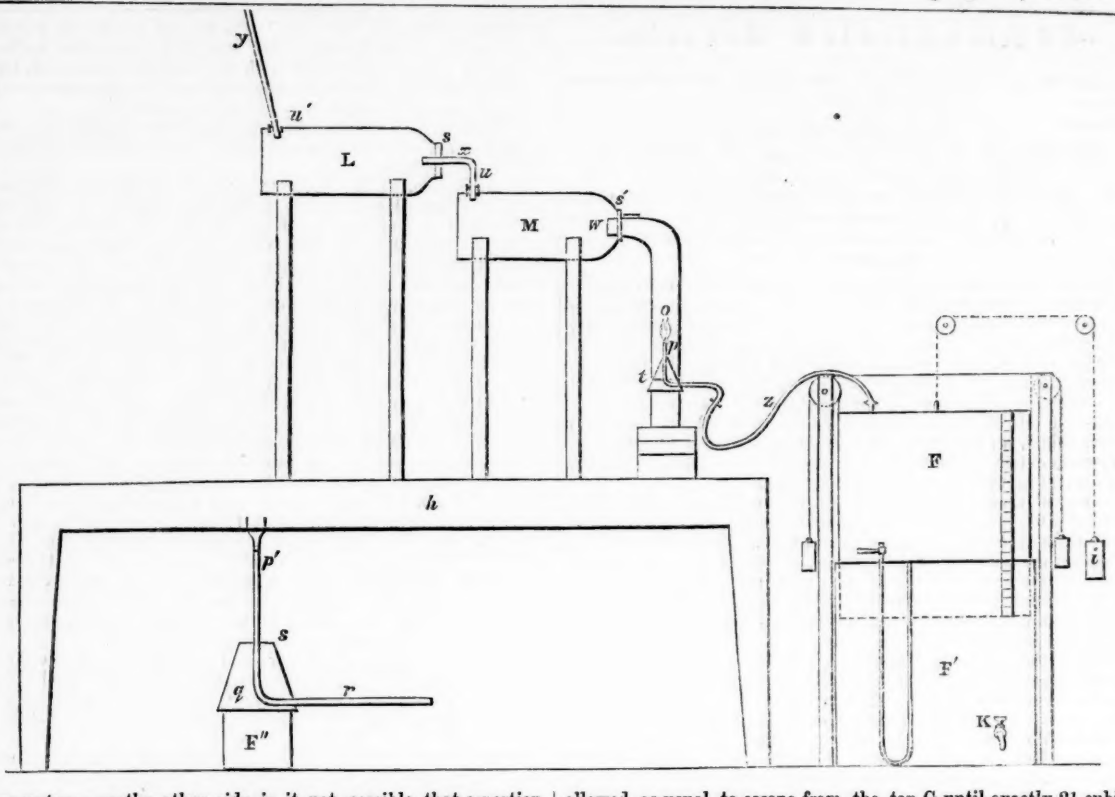
M. A. Ellissen, in the Journal of Gas Lighting of October 18th, 1864, has alluded to some of these sources of error. Nothing can be more obvious than the fact that any data to be arrived at by these experiments of mine would rely in a most important degree upon the suitable accuracy of the methods followed to determine the exact amount of sulphur present in each bulk of gas taken for comparison of result, one with another. M. Ellissen has very conclusively shown that the use of the Leslie burner for consuming the gas placed upon the bottle of ammonia under the trumpet-shaped tube, and figured in the *Chemical News* of Feb. 14th, 1863, entails some loss of sulphur, so that the quantity found by the analysis is always short of the actual quantity present. Those who have had occasion to use the Leslie burner for this purpose will doubtless have observed, soon after it is lighted, and placed in its position upon the funnel support, that the gas, so far from being consumed steadily, burned with a flickering combustion, by which it would appear (and experiments I have also made in connexion with this point further show) that a part of the gas, from this cause, escapes complete consumption. Convinced of this being so, I have, with the determination to avoid errors from this cause, confined myself in every instance to the employment of a *single* jet, and the drawing below will be of service in explaining the nature of the apparatus arrangements I have used in these further examinations.

The pipe *z*—which I always employ made of gutta-percha—having an internal diameter of one-quarter of an inch, on looking at the sketch, will be seen to serve to convey the measured gas from the gasometer F to be consumed under the trumpet-tube *o* by the single jet *p*. There is a larger drawing, F′, showing how I form this burner so that it may answer efficiently, sketched under the table-support of the condensing and burning vessels L M *o*; *q* is a cone, open at top and bottom, of tin, through which the quarter-inch brass tube *r* passes, and into which it is soldered at the side; it then continues through the narrowest part *s*, and rises so far above the level *s* that it projects 3 inches above the level *t* of the trumpet-shaped glass *o*, when resting upon the tin cone *q*, as shown in the general arrangement. The burner itself answers perfectly well if of the ordinary fish-tail construction. The vessels M and L fulfil every purpose if they have an internal diameter of 6 inches and a depth of 14 inches. The large bluish-coloured glass wide-mouthed bottles which may be procured at druggists are frequently of this capacity; and, provided a skilful hand at drilling glass can be found to cut a circular orifice at the parts shown in drawing at *u u′*, capable of being tightly and properly closed by good corks, nothing better can be employed for fulfilling the purpose of condensers of the products of combustion of the gas when burning in the trumpet-tube *o*. The mouths of these bottles, *s s′*, are generally of the diameter of about 1⅞ inch, and with a little care they are readily fitted with good close-grained corks. The cork marked *s′* receives the somewhat contracted part of the trumpet-tube *o*, having been carefully bored out to the required diameter to that end. The second cork *s* is fitted with the tube *x*, having the internal measurement of half an inch; it is then joined to the orifice *u* of the first receiver M, by being fitted to another good close-grained cork, whose diameter is suited to closely fit its aperture at *u*. Both openings in the vessels L and M may be bored out of bottles of the kind above mentioned, of three-fourths of an inch to one inch diameter, and perfectly adapted to receive and form a tight junction with a good soft cork by a moderately skilled manipulator in glass-working.

As one consequence of the substitution of the single jet for the Leslie's burner, although it is not possible to burn the gas with the same rapidity, we get a steady combustion—quite uniform, in fact—without any of the flickering induced, I always find, when the Leslie's jet is employed. It is of the greatest importance to adapt the second receiver L as shown in the arrangement; for although the first receiver M, by the heat generated from the gas burning in the tube *o* in such close proximity, may become considerably heated, the second receptacle L never does; on the contrary, it uniformly remains quite cool. Even supposing any of the products of the combustion escape condensation there, the further addition of the tube *y* fixed into the orifice at *u′* by another perforated cork (which should be of at least half an inch internal bore, and 24 to 30 inches long) must be wholly effectual in producing the final flow of all condensable required products into the second receiver.

M. Ellissen's remarks are so pertinent to this point, that I cannot refrain from quoting them:—"We may, in fact, easily imagine that, on one side, it is very difficult to cause all the very volatile sulphurous products carried along in a moderately rapid current of gas to be deposited in a cylinder *always kept at a pretty high*

* The state of the barometer was not taken into account, because during the progress of the experiments the alterations were so trifling that corrections might be wholly disregarded.



temperature; on the other side, is it not possible that a portion of the sulphur contained in the gas, especially that which forms compounds more volatile than sulphuret of carbon—sulphurous organic products, for example—should escape without being completely burnt, since even in blowpipe-burners a complete combustion of the gas is never attained."

But by the addition of some strong ammonia solution to both of the receivers, and taking care to maintain a sufficient supply about the jet of steady-burning gas, by volatilization from the bottle underneath the funnel of the trumpet-tube, my experience leads me to the conclusion that although we do not succeed in arresting *all* the sulphur of these hydrocarbon sulphides, yet we get, under these circumstances, normal relative results of such reliability, that the applications of these methods of determination, as applied to my determinations of sulphur, are proved to be sufficiently exact for that purpose as the following experiments prove:—The three gasholders figured in the drawing at page 569, were simultaneously filled with gas from the company's supply to the Queen's College laboratory. This was accomplished by first filling all three vessels with water, and this, as described before, in the cases of the gasholders A and B, was readily done by connecting the water supply H′ by tubes in succession joined to the inlets D D′ of the two pieces of apparatus, until water flowed out freely at the taps C C′, when these were shut off. A different procedure was required to similarly prepare the gasometer F (as it may be called by way of distinguishing it from the two others). To effect this, it was completely sunk in the water of its tank F′, until completely filled with its water, when the stop-cocks G and *f* were turned off; then the counterbalance weight *i* at the extremity of its line, passing over the centre pulley shown above F, was substituted by a weightier counterpoise capable of containing water more than sufficient, when filled to a certain mark, to raise the holder F to the required height over the tank F′, more water being supplied to that tank as necessity required, by reduction of its level from the elevation of the gasometer F by this means. All these arrangements were necessitated from the importance of securing an ample store of gas of one uniform kind, for preliminary trials to prove the accuracy of the described arrangements for determination of the respective amounts of sulphur in different portions of gas. When all three were thus prepared, the stop-cocks C C′ G were joined by gutta-percha tubes to the gas supply-pipe by a four-way outlet-piece, from which plan of proceeding it is evident we could pass gas simultaneously into all three of the gasholders when the supply-cock from the company's main was turned on, and then likewise turning on the stop-cocks C C′ G. The water, as thus replaced by gas, was allowed to run away to the drain by the openings *e e′* and the tap K. The tap C was very carefully adjusted, so as to compensate for increased rarefaction caused by the higher column of water contained in the vessel A, in order that all the gasholders might be filled at one time. Four equal quantities of this gas were then burned in the described apparatus. That portion collected in the gasometer F was first consumed: some was allowed, as usual, to escape from the tap G until exactly 2½ cubic feet remained there, as shown by the graduated scale *g′*. When this had been consumed, the like bulk was driven from the vessel A, through the force of water admitted at D by the cork tube and connecting-pipe to the water supply-tap H. The second and third "combustions" were both derived from the large gasholder A; *a* the fourth, and last, was in its turn transferred from the gasholder B.

The following table explains in concise terms the results obtained in these four very carefully performed experiments:—

Table showing Results obtained by burning four measured bulks of Coal Gas in the Apparatus figured above, with the precautions there described.

Experiments.	Quantity of Gas Analyzed.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
A . .	2½ c. feet	2·39 gr.	13·11 gr.
B . .	2½ c. feet	2·28 gr.	12·51 gr.
C . .	2½ c. feet	2·25 gr.	12·34 gr.
D . .	2½ c. feet	2·31 gr.	12·64 gr.

Note.—The combustion of each quantity occupied a little over six hours as nearly as possible.

When we have terminated our gas burning, the removal of the products from the condensers is somewhat troublesome. Besides this, a little of the sulphite of ammonia may slightly impregnate the corks, and this must be removed by proper means. The best way of proceeding is to begin by carefully removing the corks S S′ *u u′*, pouring the mixture of sulphite, carbonate of ammonium, with, occasionally, some unaffected ammonia, into which the ammonia placed in the condensers has been converted during the combustion of the gas, into a tolerably capacious evaporating dish; after this the tubes *o* and *x* should be rinsed thoroughly with pure hot water from a washing bottle, which rinsings may be added to the contents of the evaporating dish. Then the vessel M should be washed out by closing the aperture *u* with a well-fitting clean cork, which has been washed with distilled water, and projecting hot water from the washing bottle all over the interior. After this, its contents may again be poured into the evaporating dish. A final rinsing of this bottle will furnish the water with which we can cleanse the second condenser, L; taking care, before doing this, to insert another clean cork in the hole at *u′*. The last rinsing of this receiver is not immediately put into the evaporating basin, but into a beaker of capacity sufficient to permit the complete immersion of the cork S′ attached to the trumpet-tube *o* beneath the surface of this water. It is better, however, before so doing, to wash out the interior of the trumpet-tube with hot water; there is no difficulty in effecting this without the necessity of stopping the upper end, *s*, with a cork, if we place it inverted from the position shown in the drawing, so that, in fact, it resembles the letter V, but having one limb shorter than the other, and then by means of the wash-bottle, directing a moderately fine stream of hot water over every part of the inside of it. No one but a very clumsy operator

would cause any loss to happen by projecting the stream of water with so much force as to cause some of it to rush out at the opening of the short limb, *w*. And as occasionally, especially when the single jet is used, a deposition of whitish matter forms just above the jet, any loss of substance from a blunder of this sort must render the experiment perfectly unreliable and useless. So also we must take care to ascertain in employing the single jet, that the trumpet-tube is sufficiently hot to prevent any moisture from becoming condensed upon its interior. In an experiment I made early on in these inquiries, from the gas being burned with a very small flame, aqueous vapour condensed repeatedly at the upper part of the tube, and successively trickled down it, falling upon the tin cone, and by this consequent loss utterly destroyed all confidence in the issue of the experiment. The same means are resorted to with the view of thoroughly cleaning the long tube *y* from any adhering sulphite; and we have then, it will be perceived, successively cleaned all parts of the apparatus with the exception of the corks. The one large cork, it will be recollected, was placed to soak, still fixed to the trumpet-tube, in a small beaker of water of just sufficient capacity to hold the warm washings of the second condenser whilst completely covering it, and which it is as well to permit to remain there for about five minutes, after which it may be taken out of it, and the adhering wet shaken from it into the contents of the evaporating dish, whose fluid, it should be mentioned, during the performance of these manipulations, may be advantageously undergoing concentration by the cautious application of heat, otherwise brisk effervescence may produce some waste. If we once more place this cork in another similar quantity of pretty hot water, and leave it there for a second five minutes, we need be then under no apprehensions of any loss by adhesion of substances to the cork.

Lastly, the remaining corks *u*, *s*, and *u'* are thrown into these final rinsings; and, after a second soaking in some fresh water, we may rest assured that our efforts to secure ourselves against any possible loss have been crowned with very complete success.

By the time that the entire apparatus has been in this way effectually washed, the mixture of ammoniacal salts in the evaporating vessel has become so much diluted by the addition of the "washings," that it requires a considerable degree of evaporation to concentrate it before precipitation by a baryta salt. When 2½ cubic feet of gas has been burned, this concentration should be continued so far that after filtration (for this is always advisable) and the necessary washing of the filter-paper with boiling water, the solution has a capacity, as nearly as possible, of about 6 ounces, which may then be treated with a current of well washed chlorine gas, to convert the sulphite of ammonium into sulphate: and finally, after cautious heating, mixed with a sufficiency of chloride of barium to separate the whole of the sulphuric acid.

There is a degree of uncertainty in the employment of nitric acid in the place of chlorine as the oxodizing agent which renders its application for this end anything but advisable. Dilute solutions of ammoniacal sulphate, in the presence of an inconsiderablr excess of nitric acid, will resist the production of a precipitate fo several hours, although an ample quantity of chloride of barium may be added to them. I have often remarked that a notable amount of this sulphate, which has been properly but carefully acidified with nitric acid, and far from being in any great excess, has shown no inclination whatever to precipitate, even with the continued application of heat, for from four to five hours; yet, after 24 hours rest, a precipitate weighing from 0·6 to 0·8 has deposited on the sides and bottom of the interior of the vessel. And, irrespective of the employment of either nitric acid or chlorine in these experiments, we should make it a rule to allow the sulphate of barium 24 hours to form before attempting to separate it by filtration, also to gently heat the solution for about an hour after the addition of the precipitant; otherwise a certain loss of sulphur is inevitable in the analysis.

The way I have proceeded and the precautions I have adopted in the investigation of this sulphur question having been now fully described, and their suitability for the purpose completely demonstrated, I now pass on to describe what was done in continuation of that part of the subject where two equal quantities of the same coal—mixed together in small fragments with great care, so that identity of kind might be ensured in each instance—were distilled with conditions maintained as closely alike as it was possible to make them.

It was explained at the outset of this paper, when the digression was made to describe the experiments which doubts as to the complete safety of the processes, followed to determine the sulphur in the analyses given at page 570, led me to institute, since their publication, that the 2½ cubic feet were consumed in contact with the ammoniacal fumes; and the modifications there mentioned, as observed in performing this experiment, being now understood, require now no further explanation. After this, the other 5250 grains of coal were subjected to distillation, and the gas, without being brought into contact with any sulphide of ammonia, was collected in the gasometer, and allowed to remain there exactly the same time before being reduced to the required bulk of 2½ feet, preparatory to its combustion in the described apparatus.

The table underneath embodies the results of these two experiments:—

Statement of the quantity of Sulphur found in two equal bulks of Gas distilled under conditions as uniformly similar as possible, one portion of which had been washed with Sulphide of Ammonium on its way to the Purifiers and Gasholder, whilst the second amount had not been brought into contact with any Sulphide at all.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphide or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
1	2½ c. feet.	Yes.	5·81 gr.	31·9 gr.
2	2½ c. feet.	No.	5·99 gr.	32·8 gr.

The difference between 32·8 and 31·9, which may be taken as representing the quantity of sulphur, calculated for 100 feet, removed by the sulphides is so small, that the point may justly be raised as to whether, in these two trials, the sulphide has really effected anything at all towards accomplishing the absorption of any of these sulphur bodies. That the uncontrollable rapidity with which the gas, during the greater part of the time occupied in the experiment, was propelled through the tubes of sulphide—thus admitting of little or no opportunity for their removal by absorption—is really the explanation of a result so very opposed to every experiment mentioned in my first communication upon this subject, will, I think, after the description I have next to give of further experiments to the point, be accepted as the real elucidation of this anomaly.

All the gasholders were again filled with the gas supplied to the Queen's College laboratory, by the adoption of the same means, of which some account has been given a little way back, where these three gasholders, after being filled with water, were, by the outflow of that water, in turn refilled with gas. It should be stated that the perfect nature of all the tubes and junctions necessary to connect the stop-cocks C C' and G with the three outlets attached to the gas supply-tap was in all cases proved before collecting any of the gas in the gasholders in the following manner:—All three of the tubes joined to each of the three outlets were filled in turn with gas, and as quickly as possible severally joined to the nozzles of the stop-cocks C C' and G; then the one stop-cock of the gas supply being shut off, these three taps were turned on, by which, as may be immediately remarked, the exhaustive effects of the downward pressures of the columns of water contained in each gasholder was brought to bear upon all the tube connexions. The test of leakage by inflow of atmospheric air through any orifice would consist in more or less flow of water from the openings D D', and subsequently from *e e'*, and also in an analogous manner from a similar outlet placed nearly at the highest part of the gasometer-tank F'—not, however, shown in this drawing.

The next table gives the explanation of what was done with the four quantities of this gas collected in the afternoon and examined upon succeeding days.

Table showing the quantity of Sulphur in the form of Bisulphide of Carbon or Sulphuretted Hydrocarbons in Coal Gas, with and without exposure to the action of Sulphide of Ammonium.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphide or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
3	2½ c. feet.	Yes.	1·23 gr.	6·75 gr.
4	2½ c. feet.	No.	1·85 gr.	10·15 gr.
4	2½ c. feet.	Yes.	1·06 gr.	5·81 gr.
6	2½ c. feet.	No.	1·91 gr.	10·48 gr.

In the next four experiments the large gasholder had been filled again with the ordinary gas supply of the laboratory, but some bisulphide of carbon was passed into it at the commencement of the passage of the gas into it, by making a small V-tube, containing the bisulphide, a connecting piece in the run of tubing; next day a transfer, in the usual way, was made of the requisite 2½ cubic feet into the gasometer, and forthwith burnt in the apparatus; after which the remainder was forced through the U-tubes of bisulphide, and immediately submitted to the same operation. The experiments 9, 10, were made with a second quantity of gas conveyed afterwards to the large gasholder, and not nearly so much bisulphide of carbon was diffused into it. Nothing was attempted in the way of examination until nearly 30 hours afterwards.

Table showing the Quantity of Sulphur in the form of Bisulphide of Carbon, some of which had been diffused into the Gas, and Sulphuretted Hydrocarbons in Coal Gas, with and without exposure to the action of Sulphides of Ammonium.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphide or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
7	2½ c. feet.	Yes.	8·55 gr.	46·85
8	2½ c. feet.	No.	11·86 gr.	64·99
9	2½ c. feet.	Yes.	1·26 gr.	6·90
10	2½ c. feet.	No.	3·98 gr.	21·81

The large gasholder was again filled with the gas from the company's main, and after the usual rest, 2½ feet of the "natural" gas was burned, and the quantity of insoluble baryta salt weighed. But in the next place it was intended to give the gas such a complete washing by repeated transmission through the U-tubes of sulphide, that the possibility of the total removal of the sulphur

compounds should be clearly ascertained. To this end, after removing the remaining gas from the largest gasholder A to the gasometer F for measurement, it was again conveyed to the prepared gasholder B for subsequent propulsion at a very moderate rate, through the U-tubes back again to the gasometer F. In this case (which in the table is marked experiment 14), the gas was three successive times made to pass at a moderately regular speed again and again through the U-tubes, charged with fresh sulphide of ammonium at the outset of experiment No. 13. That numbered 14, and last undertaken, was four times made to traverse them in the same way: fresh sulphide, it should be remarked, was added at the moment before starting this series of transfers. By careful and accurate adjustment of the stop-cocks H′ and C C′ in manipulating with the gasholders, by which the flow of water is susceptible of the nicest adjustment to correspond with the flow of gas expelled at C C′, we have in our power a control to any degree over the required rate of passage of the gas through the U-tubes H.

The next table exhibits very clearly every result obtained in these last four examinations.

Table showing the quantity of Sulphur in the form of Bisulphide of Carbon or Sulphuretted Hydrocarbons in Coal Gas, with and without exposure to the action of Sulphides of Ammonium.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Sulphide or not.	Quantity of Sulphate of Barium obtained.	Sulphur in 100 Cubic Feet
11 ..	2½ c. feet.	No.	2·26 gr. ..	12·40 gr.
12 ..	2½ c. feet.	Yes.*	0·7 gr. ..	3·83 gr.
13 ..	2½ c. feet.	No.	2·41 gr. ..	13·22 gr.
14 ..	2½ c. feet.	Yes.†	none. ..	none.

But do ammoniacal sulphides exercise any prejudicial action upon illuminating power?

(*To be continued.*)

Register of New Patents.

2761.—Charles Thomas Burgess, of Brentwood. in the co. of Essex, for "*Improvements in centrifugal pumps.*" Patent dated Nov. 7, 1864.

In arranging vertical centrifugal pumps, where the pump is mounted on a wheeled carriage for ready transport from place to place, the suction-pipe is now commonly jointed, or made to swivel at a point immediately below the body of the pump. This jointed suction pipe is, however, found very inconvenient, and it renders it necessary to carry the pump at a considerable distance above the land, and thus when the water is required to be raised only to the surface of the land, as is usually the case, involves considerable loss of power.

Now, according to this invention, the pump is so arranged that a rigid suction-pipe may be conveniently used, the required inclination of the suction-pipe to suit the distance of the water below the pump being obtained by the movement of the disc or wheel-case, together with the suction-pipe, in place of by the turning of the suction-pipe separately on its joint or swivel.

The following is the arrangement preferred:—The frame on which the pump is fixed is furnished with stud-axes on each side to receive the carrying-wheels: these stud-axes are in line with the axis of the disc or wheel which is between them, and they receive the shafts by which the pump is connected with the portable engine employed in driving it. The pump-frame with the pump and suction-pipe are thus all able to turn together about the axes of the carrying-wheels, and it is thus that the required inclination of the suction-pipe is obtained.

It will be seen that in this arrangement the length of driving-belt required will not vary, whatever be the position of the suction-pipe. It is not essential, although it is convenient, that the axes of the disc or centre about which the pump pivots, and the points of attachment of the shafts, should be all in the same line, so long as the suction-pipe be made rigid with the pump-case, and the two move together in adjusting the inclination of the suction-pipe.

2770.—Charles Garton, of the city and co. of Bristol, for "*Improvements in obtaining power from liquids.*" Patent dated Nov. 8, 1864.

This invention consists in obtaining power from water and other liquids by causing the liquid to circulate in pipes through heat applied to a boiler with which the pipes are connected, and by causing the said liquid in its circulation to give rotary motion to wheels, fans, or blades placed in the pipes themselves, or in vessels closed, except to the inlet and outlet of the said liquids. The power for any purpose required is taken from the shaft to which the wheels, fans, or blades are attached.

The invention also consists in obtaining power from liquids by causing them to ascend through heat, and by employing the liquid so raised to act in its descent upon wheels, fans, or blades, as aforesaid, the liquid returning to the boiler or other vessel to be again heated, and so on.

2788.—James Alexander Manning, of the Inner Temple, London, Esq., for "*Improvements in the collection and treatment of night-soil.*" Patent dated Nov. 10, 1864.

This invention relates to certain improvements in the inventions for which letters patent were granted to the present patentee on the 3rd of May, 1861 (No. 1115), and the 4th of Feb., 1863 (No. 321), respectively. It consists of an improved mode of collecting and treating night-soil, and converting it into manure without creating a nuisance whilst carrying on the process to which it is subjected, and without losing any of the elements or fertilizing properties of the mixed solid and fluid human excreta which are useful to agriculture. The mode of collecting the excreta is by the application of a hose or pipe to the cesspit, which hose is connected with a close-covered cart or moveable air-tight vessel of cast-iron or other material, such carriages having affixed to them exhaust-pumps, by which the cesspits may be emptied in the course of a few minutes, without creating any offensive odour. When the cesspit is emptied, it is strewed over on the bottom with a sufficient quantity of a dry powder, composed of equal weights of dry seaweed and sulphuric acid, in which the dry seaweed has been dissolved, or, if preferred, superphosphate of lime may be used. The excreta is conveyed to the factory in a covered tank, and is allowed to flow from thence by gravitation through a conduit or pipe to evaporating pans made of wrought-iron or other metal or material, the furnaces underneath the pans carrying nothing into the chimney-shafts but the smoke of the coal consumed during the operation. The interiors of these pans are furnished with agitators for stirring the liquid and allowing the vapour to pass off more rapidly; and, if found useful in practice, cold or hot air may be introduced into the pans from time to time, to assist in driving off the vapours and gases with greater force to their destination. From the centre of the cover of each pan rises a short perpendicular pipe or shaft, communicating with a horizontal cylinder which receives the vapours rising from the excreta when subjected to an elevated temperature. These vapours are drawn from the cylinder by means of a fanner into a condenser or absorber, in which are a series of overlapping trays of slate or other suitable material to receive the water, which is supplied at the top of the condenser from a tank or otherwise, and which forms an unbroken stream from one tray to another from the top of the condenser to the bottom, the gases or vapours entering at the middle or other suitable part of the condenser. In this manner the vapours are condensed, and the gases being absorbed, the whole passes off free from smell into any convenient receptacle.

When the liquid is nearly evaporated, the contents of the evaporating pans are drawn off into drying-rooms, where they are spread thinly over the floors, and completely deprived of their remaining moisture; such floors being heated by the waste heat from the furnace or flues, or by steam-jackets if preferred. The manure when dried is conveyed into rooms for manipulation, through a covered way, which has no communication with the external atmosphere. When sufficiently cool it is passed through a disintegrating machine, and reduced to a state of powder for the market.

2791.—Marc Antoine François Mennons, of the firm of Mennons and Telescheff, of Abingdon Chambers, in the city of Westminster, and 24, Rue de Dunkerque, Paris, in the empire of France, for "*Improvements in globes or shades for lighting apparatus.*" A communication. Provisional protection only obtained. Dated Nov. 10, 1864.

This invention relates to the application of transparent photographs to the globes or shades of lamps and other descriptions of lighting apparatus. To this end the globe or shade is pierced with a certain number of holes of variable dimensions, in each of which is set a frame of copper, brass, or other suitable metal. The photographic subjects, which may be formed on glass or paper, are inserted into these frames, and being each backed up by a sheet of ground glass, are secured in position by any of the known processes.

2827.—Charles Esplin, of 32, Tyer Street, Lambeth, in the co. of Surrey, for "*Improvements in apparatus for regulating the supply of gas.*" Provisional protection only obtained. Dated Nov. 12, 1864.

This invention has for its object improvement in apparatus for regulating the supply of gas. In order more readily to regulate the flow of gas coming from a gas-main to a building or other place where several burners are employed on the same supply, and where such burners are more or less distant from each other, and from the supply-pipe from the main, apparatus is applied in the following manner:—On the supply-pipe coming from the main there is a diaphragm, valve, or cock; at the back of the cover of this diaphragm is applied the end of a small tube. The other end of this tube may be in any desired position in the building or place, and more or less distant from the supply-pipe, depending on the locality where it may be wished to have the power of regulating the whole supply of gas, without having to go to the cock or valve above mentioned, which is on the supply-pipe. In such more or less distant locality the other end of the small pipe is fixed to a vessel, which is divided by a diaphragm of larger diameter than that of the valve or cock before mentioned. The small tube is to be full of air, or it may be other fluid. The regulation of the supply of gas is effected by causing the air or other fluid contained in the small tube to be pressed on by the regulating diaphragm, acted on by means of a screw or other instrument, by which the fluid will press on the diaphragm in the cock or valve on the supply-pipe, and thus the passage of the gas from the main to the supply-pipe will be lessened. The reverse action will follow the moving back of the regulating diaphragm, as the passage for the flow of gas through the cock or valve on the supply-pipe will then be enlarged.

2830.—William Edward Gedge, of the firm of John Gedge and Son, 11, Wellington Street, Strand, in the co. of Middlesex, for "*Improvements in pumps.*" A communication. Provisional protection only obtained. Dated Nov. 12, 1864.

The improvements in the ordinary pump consist in the employment of a receiver into which penetrates a tube which is isolated in the receiver, and presents a solution of continuity with the suction-pipe. This very simple arrangement permits the use of a suction-pipe of section one-half less than that of the tube, yet nevertheless giving a quantity of water equal to that which would be given by an ordinary pump having a suction-pipe of an equal section with the tube.

The piston used in this invention is composed of four principal parts. 1. Of a circular cast-iron plate pierced besides the central hole intended to receive the piston-rod, with four openings intended to allow the water to penetrate above the piston. 2. Of a cylindrical leather, its base acting as piston, and also pierced with five openings intended for the same purpose. 3. Of a second circular cast-iron plate, also pierced with five openings equal to the preceding. 4. Of a circular valve, also of cast-iron, traversed, easily following its axis by the piston-rod.

* Transmitted three times through the sulphide of ammonium. No precipitate appeared after adding chloride of barium and heating until 12 hours had elapsed.

† This gas (14) had been driven, at the usual moderate rate of transit, four successive times through the U-tubes of sulphide. Not a trace of precipitate was obtained after mixing with chloride of barium, application of heat, and 18 hours rest.

APPLICATIONS FOR LETTERS PATENT.

2167.—JOHN NEWTON, of Preston, in the co. of Lancaster, civil engineer, for "*An improved gully or stench-trap for the prevention of the escape of noxious effluvia from drains or sewers, and for preventing the ingress of sand or other solid matters into the same.*" Aug. 23, 1865.

2184—EDWIN AUGUSTUS CURLEY, of 11, Amwell Street, Clerkenwell, London, mechanical engineer, for "*Improvements in appliances by means of which certain liquids, common air, and certain elastic fluids are made available in the production of light, and their quantity regulated and measured, part of which improvements are applicable for other purposes.*" Aug. 25, 1865.

2191.—JOHN MOULE, manufacturing chemist, of 391, Hackney Road, London, for "*An improvement in the treatment of tar and other substances to be used as paint, and for other purposes.*" Aug. 25, 1865.

2195.—JOHN FORDRED, of Blackheath, in the co. of Kent, gentleman, for "*Improvements in the treatment of certain products obtained in the refining of petroleum and of other hydrocarbon oils.*" Aug. 26, 1865.

2199.—ROBERT GORDON RATTRAY, of Aberdeen, M.D., for "*Improvements in apparatus for supplying regulated or measured quantities of water.*" Aug. 26, 1865.

2220.—WILLIAM HENRY GUMMER, of Rotherham, in the co. of York, for "*An improved stench-trap and sink-pipe protector.*" Aug. 29, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1996.—JAMES M'EWAN, engineer, and WILLIAM NEILSON, builder, both of Glasgow, in the co. of Lanark, N.B., for "*Improvements in the raising, lifting, or drawing and forcing of water and other liquids, and in the apparatus and means employed therefor.*" Aug. 2, 1865.

2095.—HENRY WOODWARD, of Cannon Street, in the City of London, gas engineer, for "*Improvements in carburetting coal gas, and manufacturing artificial gas, and in the machinery or apparatus employed therein.*" Aug. 12, 1865.

2111.—JAMES BILLINGS, of Kentish Town, in the co. of Middlesex, accountant, for "*Improvements in ventilators.*" Aug. 16, 1865.

NOTICES TO PROCEED.

1072.—THOMAS NEWBIGGING, gas engineer, and ALEXANDER HINDLE, gas-fitter, both of Bacup, in the co. of Lancaster, for "*Improvements in wet gas-meters.*" April 17, 1865.

1074.—LOUIS DE ST. CÉRAN, gentleman, of 51, Rue de Malte, Paris, for "*Certain improvements in gas-ammoniacal engines.*" April 17, 1865.

1099.—MEGUERDITCH HOUSSEPIAN, of Manchester, merchant, for "*Certain improvements in pumps.*" A communication. April 20, 1865.

1370.—WILLIAM RICHARD WILLIAMS, of Northumberland Court, Charing Cross, London, gas engineer, for, "*Improvements in dry gas-meters.*" May 18, 1865.

1411.—EDWARD M'NALLY, of Manchester, engineer, for "*Certain improvements in apparatus for cutting or forming screws, which is also applicable for cutting pipes or tubes.*" May 23, 1865.

1958.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*An improved water-meter, which may be employed as a water, steam, or gas engine.*" A communication. July 28, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2267.—JOHN COOPER, "*Improvements in valves and buckets for pumps, and in valves or cocks for other uses.*" Aug. 13, 1862.

2286.—GEORGE WHITE, FRANCIS BUCKLAND, and CHARLES REES, "*Improvements in the manufacture of water-closets.*" Aug. 14, 1862.

2313.—FREDERICK BARNETT, "*An improved lamp or lantern for street lighting and other purposes.*" Aug. 18, 1862.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

1909.—FRANCIS PULS, "*Improvements in the distillation of coal.*" Aug. 23, 1858.

1910.—FRANCIS PULS, "*Improvements in the distillation of bituminous matters and gas tar.*" Aug. 23, 1858.

Legal Intelligence.

BARNET PETTY SESSIONS.

MONDAY, AUGUST 21.

(*Before* N. B. ACWORTH, *Esq., Chairman; and* H. E. C. STAPYLTON, *Esq.*)

Mr. *John Mitchell* and Mr. *Henry Smith*, the present overseers of the parish of East Barnet, were summoned under the 38th section of the Act 3 and 4 Wm. IV., cap. 90, to show cause why they refused or neglected to comply with an order made upon them, or their predecessors in office, by the inspectors appointed according to the provisions of this Act, to levy a rate for the payment of the amount due for lighting the public highways.

Mr. WOOLLETT, barrister, appeared for the inspectors, and Mr. ROOKE, a solicitor, for the overseers.

Mr. WOOLLETT said he had the honour to appear in support of this summons, which had been taken out under the provisions of a very salutary Act of Parliament. It appeared that the town of East Barnet was lighted by some gentlemen who were the proprietors of the gas-works. It had been thought advisable by the inhabitants of that place that a rate should be made for the purpose of meeting the necessary expenditure, and that they should not be dependent upon voluntary contributions for the payment of that service which was so beneficial to all. It was accordingly agreed by them to adopt the provisions of the Act 3 and 4 Wm. IV., cap. 90, which enabled a parish meeting, convened as therein provided, to appoint inspectors for the purposes of the Act, by whom an order was to be made upon the overseers to levy a rate for the expenses of lighting the parish. It appeared that these necessary steps were taken in October last, and an arrangement was entered into with Messrs. Pontifex and Skelton, the owners of the gas-works, for lighting the public lamps of the parish. An order was afterwards made by the inspectors upon the then overseers to levy the sum of £200 in payment of the amount due under the contract, but the overseers refused to make the rate, alleging that it was illegal; and their successors, who were subsequently applied to, refused on the same ground. The gentlemen summoned on this occasion were the existing overseers, and he (Mr. Woollett) could scarcely understand upon what ground they justified their refusal to comply with the order made upon them. They were the officers of the parish, and ought to be the very first to endeavour to carry out the salutary provisions of the Act, and not to offer obstacles to its adoption. The section under which these proceedings were instituted was the 38th, which enacted "that in case the amount directed by such order as aforesaid to be paid by the overseers in any parish to which all or any of the provisions of this Act shall be extended shall not be paid to the said treasurer within the time specified for that purpose in the said order, any justice of the peace, upon complaint thereof made to him by the said treasurer or by any one of the inspectors, may and he is hereby authorized and required to issue a summons under his hand and seal for the said overseers so refusing or neglecting to pay such money as aforesaid to appear before two justices of the peace; and upon the said overseers appearing, or having been so summoned and not appearing, without some sufficient and reasonable excuse, or not being found, it shall be lawful for the said justices and they are hereby required, in case the said money is not paid, to issue their warrant for levying the amount, or so much thereof as may be in arrear, by distress and sale of the goods of all or any of the said overseers; and in case the goods of all the overseers shall not be sufficient to pay the same, the arrears thereof shall be added to the amount of the next levy which shall be directed to be made in such parish for the purposes of this Act, and shall be collected by the like method." Therefore the justices here (unless the overseers could show sufficient legal excuse and ground for not levying this rate) had no discretion. They were obliged under the Act to issue their summons, and they were also obliged, in default of "some sufficient and reasonable excuse," to issue their warrant. As he had already remarked, he did not at all know the ground upon which his friend who represented the overseers intended to resist the rate; perhaps he would enlighten him upon the subject.

Mr. ROOKE said he intended to shorten the proceedings as much as possible. He would ask the learned counsel to make such a preliminary statement as would give him ground for raising the objections he proposed to take. The complainants were bound to prove their case.

The CHAIRMAN: And supposing they have done all that is required by the Act of Parliament?

Mr. ROOKE: Then your order must go.

Mr. WOOLLETT: If you will tell me your point, I may meet it by anticipation.

Mr. ROOKE: There are several points, but it would be premature to state them now.

Mr. WOOLLETT: The overseers are the officers of the parish, and they have to make a legal excuse for not levying the amount of the order. I should have thought they would at once come forward to state what it is.

The CHAIRMAN: The 38th section of the Act seems to assume a previous one—that the inspectors are legally appointed. Is there anything in your objection as to that?

Mr. ROOKE: Yes; that is an objection to these proceedings *ab initio*.

Mr. WOOLLETT: My friend is not obliged to enlighten me as to his points.

The CHAIRMAN: You had better prove your case. If the parties did not attend you would have to do so.

Mr. STAPYLTON: I suppose you mean to make him prove his case step by step?

Mr. ROOKE: I do.

Mr. WOOLLETT said if he were called upon to prove all that the Statute required, he was perfectly able to do it, but he thought it would shorten the proceedings if his friend would state at once whether he was prepared to admit anything. The Statute under which this summons was issued commenced by stating that, upon the application of three inhabitant ratepayers, the churchwardens were to convene a meeting to determine whether the provisions of the Act should be adopted. He was in a position to produce the original requisition, signed not by three, but by a dozen of the ratepayers. By the evidence of one of the churchwardens he would show that the notice required by the 5th section of the Act to be given of the time and place for holding the meeting, was duly issued; and other witnesses would prove that they saw it posted on the church-door. The evidence would also establish the fact that the meeting so called took place, and that everything in connexion with it took place regularly. He should prove that by the votes of that meeting, no poll being demanded, it was resolved to adopt the provisions of the Act; that three inspectors were appointed to carry them out; and that afterwards, pursuant to the Statute, a proper public notice was exhibited on the churches in the district within the time limited by the 15th section. He should prove further that an order was served upon the then acting overseers, pursuant to section 32, to levy the amount mentioned in such order; and having established all these points, he should submit to the bench that three months having elapsed since the date of such order, the complainants were justified in asking the magistrates to issue their warrant, under the 38th section, for levying the amount upon the overseers.

Mr. ROOKE said he was ready to admit the fact of the demand having been made. The learned counsel had inadvertently not alluded to the mode of appointing the inspectors. He called attention to this, because it was one of the points to which he should hereafter have to refer. The 17th section enacted that "the inspectors herein mentioned shall be elected in manner following—that is to say, the churchwardens of any parish adopting the provisions of this Act shall, in the manner herein first directed, forthwith call a meeting of the ratepayers of such parish," &c. The "herein first directed" referred to the mode of proceeding at the meeting. This was one of the points upon which his objection was founded. There were others which he would mention as the case proceeded.

The CHAIRMAN: Then one of your points is that the inspectors are not properly appointed?

Mr. ROOKE: That is what I call my second point. The first has not yet cropped up.

Mr. WOOLLETT: The second objection will be a question of fact. I was going to say that, looking carefully at the Statute, I shall submit to the bench that, though prepared to do so, there are a great many points which it is not necessary for me to prove.

The CHAIRMAN: You must bear in mind that we are required to issue our warrant, and we must see that we are legally justified in doing so. We cannot, therefore, dispense with proofs.

The CLERK (Mr. Harris): Supposing the magistrates issue their warrant for levying the amount of the order upon the overseers, and it is not legal, they would be liable to have an action brought against them.

Mr. WOOLLETT: I am going to prove every one of the points, but I submit it is not necessary to do so, and that the mere fact for me to prove, for the purpose of obtaining the warrant, is, that the persons summoned are the acting overseers of the parish; that they have received an order as the servants of the parish to levy this rate, and that they cannot themselves question the commencement of these proceedings, or the legality of the meetings, or anything of the kind. They are the servants of the parish, and are bound to act upon the orders of the inspectors, unless they can show that they are legally excused. It is for them now to do that. Of course, I am well aware that the magistrates would like before issuing their warrant to feel that they were not only justified in doing so, but required by the Statute to do it. For that reason I shall go into all the points, still reserving to myself the right to contend that the establishing of many of these points is not necessary to our case. Before calling my witnesses, I would just direct the magistrates attention to the 30th section, which provides that the proceedings at meetings of inspectors shall be entered in books, which shall be good evidence.

Mr. *Elijah Simpson*, examined by Mr. WOOLLETT.

I was one of the churchwarden of East Barnet, at the time I received the requisition to hold a meeting. I produce the requisition.

Mr. ROOKE: Allow me to look at it [handed up]. When did you receive it?

Witness: I cannot say.

Mr. ROOKE: You must tell me.

Witness: Let me look at it again [handed to witness]. Am I obliged to tell the exact date?

The CHAIRMAN: I am afraid so, because you must call the meeting within a certain time afterwards.

Witness: I am prepared to swear that I received it about the 2nd of October.

Mr. ROOKE: Do you observe that there is no date to it?

Witness: I observe it now. Is it necessary it should be dated? I am quite sure the meeting was convened within ten days afterwards.

By Mr. WOOLLETT: On receiving that requisition, I prepared a notice calling the meeting, of which the document produced is a copy. The notice was affixed to the door of East Barnet parish church; I saw it there on the 16th of October. The meeting was held on the 20th.

Mr. ROOKE: I do not wish to mislead the witness. He has sworn that this is a true copy of the notice; but he has made a mistake, I am sure.

Examination continued: I was present at the meeting, and was elected to the chair. The persons who attended that meeting were, I believe, all ratepayers. As the chairman, I read the requisition and the notice convening the meeting. There was not any objection made at that time. It was proposed by one party that it would be better to adjourn the meeting for some further consideration of the Act of Parliament, before proceedings were taken.

Mr. WOOLLETT: Now, I think from this point we are entitled to read the minutes of the meeting *de bene esse*.

Mr. ROOKE: I must object. Who took the minutes?

Mr. WOOLLETT: That is another matter entirely. (To witness:) Look at this; did you keep this book?

Witness: That was kept by Mr. Humphrys.

Mr. *Humphrys*, clerk to the inspectors, was called, and stated that the minutes were in his handwriting; that they were copied, shortly after the meeting, from rough notes taken at the time, which rough notes he produced. The minute-book was signed by the chairman at the next meeting.

Examination of Mr. SIMPSON continued: I cannot say whether the whole of those present at the meeting had been ratepayers for twelve months.

The CHAIRMAN: It is not necessary to prove that they were all ratepayers. If a meeting of ratepayers is convened, and a man who is not a ratepayer thrusts himself in, that would not vitiate the proceedings.

Examination continued: I have counted the names of twelve persons present who I should say had been ratepayers for twelve months previously. There was no seconder to the proposal for adjournment, and there was no adjournment. There were three inspectors appointed at the meeting—Mr. Nuttall, Mr. Macbride, and Mr. Baxter. They were all ratepayers, and I believe they were all qualified according to the Act.

The CHAIRMAN: Does the Act require any qualification?

Mr. WOOLLETT: No other than my friend has read.

The CLERK: They must be £15 ratepayers.

Witness: These gentlemen were duly appointed by the votes of the meeting, and it was agreed, without any dissentients, that a sum not to exceed £200 should be raised by the inspectors, under the provisions of this Act. I afterwards signed a notice of the adoption of the Act, which notice stated the sum to be raised in the succeeding year and the number of inspectors appointed. [Notice produced and read.] This notice was also signed by Mr. Dods, the other churchwarden, and posted on the church-door within a few days after the meeting. One of the inspectors appointed (Mr. Baxter) declined to act.

The CHAIRMAN: Does the Act of Parliament make any provision for a case of that kind?

Mr. ROOKE: Yes.

Witness: A notice was posted on the church-door convening a public meeting to appoint another inspector.

Mr. ROOKE called for the production of the notice.

Mr. WOOLLETT said it was not necessary to produce it. All that was required was to prove that some person saw it there.

Mr. ROOKE said this was one of the points of objection he intended to raise.

The CHAIRMAN said it would not do to take the witness's statement of the fact of a notice; he must give the words of it.

Mr. WOOLLETT said no doubt in all these cases it would be much better if copies of all notices were kept; but he had not been so long in the profession without having learnt that out of any fifty notices given perhaps hardly a copy of one could be produced.

After a conference between Mr. Woollett and Mr. Rooke, the latter produced the original notice.

Examination continued: The meeting was held on the 2nd of November, and Mr. Oakeshot was appointed to the vacancy. He was duly qualified for the office. A meeting of the inspectors was afterwards held. The overseers at that time were Mr. John Davis and Mr. H. B. Bingham.

Mr. ROOKE said if the examination were stopped at this point he could perhaps shorten the proceedings, after putting a few questions to witness.

Cross-examined by Mr. ROOKE: I have been a ratepayer in the parish for twelve years. I do not know how many thousand acres it contains.

Mr. WOOLLETT: Surely that can have nothing to do with the question. You might as well ask what is the size of Turkey.

Mr. ROOKE: I want to show what kind of a meeting this was.

The CHAIRMAN: If it was a legal meeting it does not signify.

Mr. ROOKE said he wanted to show that this was all done in one corner of the parish; but he would not press the point.

Cross-examination continued: There are about 1200 inhabitants in the parish, of whom about 300 are ratepayers. I should say there were forty present at the meeting. I have not the names of all those who were present.

The CHAIRMAN said he did not think it was necessary to take down the names of all the persons present; it was not often done. Upon reference, however, to the 8th section, which requires that the resolution to adopt the provisions of the Act must be carried by a majority of two-thirds of the votes of the ratepayers present, he thought in this case it would be necessary.

Cross-examination continued: At the first meeting, Mr. Baxter moved and Mr. Oakeshot seconded a proposition, that the meeting should be adjourned for fourteen days. As far as my memory serves me, Mr. Baxter thought the proceedings were premature, and that the Act of Parliament should be more ventilated in the parish. We knew what the parish was and what it is capable of doing, and therefore thought it better to proceed with the business for which the meeting was convened.

Mr. WOOLLETT said he thought they were launching out into an inquiry which was quite immaterial. The minutes of what took place were before the bench, and those minutes were evidence. He ventured to submit that his friend was not at liberty to go into the question of what speeches were made at the meeting or what reasons were assigned for moving an adjournment. The resolutions adopted were carried by a unanimous vote; at least there was no objection made. The result was, the Act was adopted and inspectors appointed.

Cross-examination continued: When the meeting objected to the fourteen days adjournment, four ratepayers did not leave the meeting. My co-churchwarden, Mr. Dods, left.

The CHAIRMAN called attention to an informality in the minutes, it being stated in one place that, in favour of the resolution to adopt the provisions of the Act, twelve hands were held up, and in another that it was carried unanimously.

Witness accounted for the apparent discrepancy by stating that after the resolution was first put to a show of hands a discussion took place, when the question was again put, and carried without a dissentient.

Mr. Rooke produced the original notice affixed to the church-doors, and pointed out a discrepancy in the copy to which the witness had sworn; but the chairman thought the variation was not important.

Cross-examination continued: I believe it is Mr. Dods' signature to the notice. I did not see him sign it. I indited the notice, and it is in the handwriting of one of my young men. The second notice I think is in Mr. Humphrys' writing. The signature of Mr. Dods' is in his own handwriting. The third notice (that convening the meeting for the appointment of an inspector in the place of Mr. Baxter) was prepared, I dare say, in the same way as the others. The signature of Mr. Dods to it, I should say, is not in his handwriting.

Mr. ROOKE said in that case there was no evidence before the magistrates of the appointment of a third inspector. The Act required that there should not be less than three. This alone, he submitted, was fatal to the proceedings. There was one other objection which he had to raise.

The CHAIRMAN: Your second point is that the third inspector was not properly appointed under the Act.

Mr. ROOKE: That no notice of meeting for the purpose, signed by the two churchwardens, was given. There is another equally fatal objection, which I will point out if you will do me the kindness to look at the 5th section. It says: "From and after the passing of this Act, upon the application in writing of three or more of the ratepayers of any parish, it shall be lawful for the churchwardens thereof, and they are hereby required, within ten days after the receipt of such application as aforesaid, to appoint and notify a time and place for a public meeting of the ratepayers of the said parish for the purpose of"—what?—"of *determining* whether the provisions in this Act contained shall be adopted and carried into execution in the said parish." The notice, therefore, ought to be—"A public meeting of the ratepayers of the parish will be held on (some day within ten days of the date of the requisition) for the purpose of determining whether the provisions of the Act 3 and 4 Wm. IV., cap. 90, shall be adopted and carried into execution in the said parish." Well, what is the notice?—or rather, I will take first the requisition, in order to show their inconsistency with each other and with the Act of Parliament, and therefore misleading. No wonder that there were only twenty ratepayers present at the meeting. You will see, in a moment, that the parish was misled. The requisition to the churchwardens is the foundation of all these proceedings, and that requisition is "to call a public meeting to take into consideration the propriety of adopting the Act of Parliament passed in the reign of his late Majesty Wm. IV., dated 28th of August, 1833, relating to the lighting and watching of parishes in England and Wales, so far as relates to the lighting of the streets and roads of this parish." Now if the notice convening the meeting had followed the language of this requisition, I should have a difficulty to persuade you the meeting was an informal one; but if you look at the notice, you will find it is neither in accordance with the requisition nor with the terms of the section of the Act. It is as follows:—"Notice is hereby given, that a public meeting will be held in the Lecture Hall, New Barnet, on Tuesday, the 18th inst., to consider the question of lighting the parish of East Barnet with gas from the works at New Barnet, a requisition to this effect having been made to the churchwardens." Now there was no requisition to that effect.

Mr. WOOLLETT: It is not necessary for it to be in the same terms.

The CHAIRMAN: You say it ought to follow the language of the Act of Parliament?

Mr. ROOKE: Yes. (To witness:) Do you not know of your own knowledge that Mr. Dods has disavowed the signature to the third notice?

Witness: He has not said so.

Mr. WOOLLETT: What Mr. Dods has said will not do.

The CHAIRMAN: Unless you call Mr. Dods to prove the signature, I should upon your own witness's statement, not accept it as his.

Mr. WOOLLETT (to witness): Do you say it is not Mr. Dods signature?

Witness: I should say not.

Mr. WOOLLETT: Whose is it?

Witness: I signed it myself. I did so because there was great difficulty in meeting with Mr. Dods to do it. I signed it for myself and for him.

Mr. WOOLLETT said he would produce authorities, if necessary, to show that the signature of one churchwarden for himself and colleague was sufficient. Moreover, he contended that where persons had acted as inspectors, all previous notices were held to be good. An objection could not afterwards be taken to the appointment except by *quo warranto*.

The CHAIRMAN said a man might thrust himself into an office to which he had not been appointed.

Mr. WOOLLETT, with all deferance to the bench, would submit that the acting was sufficient.

Re-examination continued: The three gentlemen now filling the office have acted as inspectors from the time of their appointment at the meeting, and no objection has been made to the legality of their appointment.

By Mr. STAPYLTON: Mr. Baxter and Mr. Dods left the room after the former had proposed that the meeting should be adjourned. The motion for adopting the Act was then put and carried, twelve hands being held up for it. I have no means of knowing that those twelve represented two-thirds of the ratepayers present, except my own supposition. I have not got the names of the twelve. When the motion was afterwards put and "carried unanimously," I should say there were some persons who did not vote, as there were many there who were not ratepayers. I have no proof that two-thirds of the ratepayers present held up their hands.

Mr. STAPYLTON: It seems to me that that is the essence of the whole case.

Mr. WOOLLETT: There was no one opposed the motion.

Mr. ROOKE: You had got rid of your opponents.

Mr. WOOLLETT, in reply to the bench, said he had other witnesses who would prove that two-thirds of the ratepayers present voted for the motion. But if the magistrates thought that the objections started by his friend were valid, it would be unnecessary to go on. His friend objected that one of the signatures to the notice convening the meeting for the appointment of a third inspector not being that of Mr. Dods himself, it was fatal to the case. He (Mr. Woollett) submitted that such was not the fact, and if the bench should decide against him he should probably advise his clients to take the question to the Court of Queen's Bench. Perhaps the bench would decide the point before proceeding further.

The CHAIRMAN said if it was likely the case would hereafter go to the Queen's Bench, it would be well to take it upon all the points, so as to have it complete.

Mr. *W. C. Humphrys*, examined by Mr. WOOLLETT.

I am clerk to the inspectors, and keep the minute-book. The signatures to the requisition are all those of ratepayers. I took it round, and saw it signed. There are over twenty names to it. I saw the notice on the church-door the Sunday before the meeting. I was present at the meeting. There were some persons there who were not ratepayers, and the twelve whose names are in the minutes as voting for proceeding to the adoption of the Act were a majority of the ratepayers present. They were more than two-thirds. The motion, "that the Act as regards the lighting be adopted," was carried unanimously; there was no opposition whatever. The chairman asked those who voted for the motion to hold up their hands, and those who voted against it to hold up theirs, and there were no dissentients. There were some present who did not hold up their hands at all. I afterwards saw the notice of the adoption of the Act on the church-door, and also the notice calling another meeting to elect another inspector. I know as a fact that the gentlemen appointed have acted as inspectors ever since at all the meetings that have taken place. The minutes contain the names of all the ratepayers present at the meeting. There were about forty persons there in all, but those who were not ratepayers were not put down.

Cross-examined by Mr. ROOKE: I have been for many years in the parish, and am connected with the gas-works. I took the requisition round to get it signed. I did not get any refusals. I do not mean to say that all the twenty who signed it had been ratepayers for twelve months. (Witness was asked about the length of residence of several of the gentlemen by name.) I was a ratepayer myself at the time.

Re-examined by Mr. WOOLLETT: I only took down the names of persons at the meeting whom I knew to be ratepayers. There might have been ratepayers present whose names I did not know. About sixteen of those whose names are entered on the minutes had been ratepayers for twelve months. I include in that number Mr. Baxter and Mr. Dods. They had left the room when the vote was taken, so that the number was reduced to fourteen.

The CHAIRMAN: And yet they are described as being present, and assenting to the resolution. The minutes ought to have stated that these gentlemen had left the room.

Mr. WOOLLETT admitted that it would have been better to do so, but he did not suppose the omission was meant to deceive.

Re-examination continued: When the twelve hands were held up for the adoption of the Act, there were fourteen persons in the room who had been ratepayers for one year.

By Mr. STAPYLTON: The minutes are in the handwriting of Mr. Pontifex. The vestry-clerk was not present as he ought to have been, and, in consequence, some one was asked to take the minutes, and he did it.

By Mr. ROOKE: Mr. Pontifex is one of the proprietors of the gas-works.

Mr. *Samuel Pontifex*, examined by Mr. WOOLLETT.

I am part proprietor of the gas-works at New Barnet; Mr. Skelton is the other proprietor. There are no other gas-works, so that, if the town is to be lighted, it must be lighted by us. I am a ratepayer, and have been so for some years. The feeling of the parishioners of New Barnet is almost unanimous in favour of the parish being lighted.

Mr. ROOKE said he could prove that the majority was the other way.

The CHAIRMAN said the only question was, whether the requirements of the Act of Parliament had been carried out. If this matter was hereafter to be taken to the Queen's Bench, the magistrates must object to such evidence.

Mr. WOOLLETT said there was a court outside, and he did not wish Mr. Pontifex to be subject to remarks that this was his own act only. It was imputed that this was a hole-and-corner affair, and he wished to show that a large majority of the ratepayers were in favour of the adoption of the Act. The last witness stated that he met with no refusals to sign the requisition.

Examination continued: I was present at the first meeting. I think there were twenty-five ratepayers there, and that fifteen or sixteen hands were held up in favour of the adoption of the Act. A motion for an adjournment had been made, but it was resolved that the meeting at once proceed to business. There were no hands held up against the motion for adopting the Act, and it was declared by the chairman to be carried unanimously.

Mr. *Josh. Oakeshot* and Mr. *Macbride*, two of the inspectors appointed at the meeting, corroborated the statements made by the previous witnesses as to the proceedings at the meeting, in all material respects.

The order made upon the overseers, dated the 14th of March, was put in, and admitted.

The CHAIRMAN: Your points, Mr. Rooke, are that the notice of meeting for the substitution of Mr. Oakeshot in lieu of Mr. Baxter, as an inspector, was not signed by both the churchwardens, and therefore inoperative; and that the requisition and notice for the first meeting were not in accordance with the Act of Parliament?

Mr. ROOKE: Then there is a third objection. It does not appear from the evidence that the motion for the adoption of the Act was regularly carried by two-thirds of the ratepayers present.

The CHAIRMAN: No doubt that is a point.

Mr. ROOKE: Mr. Simpson swore that there were 40 present, and Mr. Pontifex swore there were 25.

The CHAIRMAN: It is rather an important point, this.

Mr. WOOLLETT asked that the case might be adjourned at this stage, that he might come prepared on a future occasion to argue the points of law raised. It was impossible for him to do so now, as they had come upon him by surprise.

The CHAIRMAN said the case would be adjourned for the convenience of the bench, but he did not think it would be adjourned for the convenience of counsel, who ought to have all the points at his finger's end.

Mr. WOOLLETT said the practice in the Queen's Bench was for each party to give to the other the points upon which it was intended to rely. If that had been done here, he would have been prepared with authorities on the other side. In a recent case of a similar nature to the present, Mr. D'Eyncourt, the police-magistrate, assented to an application for an adjournment. The most important point for him to deal with arose out of the notice, the signature to which it was admitted was not in the handwriting of Mr. Dods, the churchwarden. He should have to satisfy the bench that it was not necessary it should be in his handwriting, and then, that it was altogether immaterial, inasmuch as the inspectors had been acting as such ever since.

After a long conversation on the subject, it was decided that the case should, as far as the parties were concerned, be completed at this sitting, and that the magistrates should appoint a future day for giving their decision upon it. It was also agreed between the parties that compliance with all the conditions of the Act, save those on which points had been raised, should be taken as proved.

Mr. WOOLLETT proceeded to address the bench, submitting that with reference to the notice of meeting to appoint a third inspector, Mr. Simpson was entitled to sign the same for himself and co-churchwarden, Mr. Dods. The object of the Act of Parliament was not to have a special pleading notice, but such a notice as should convey publicity to the ratepayers. Therefore if it had been signed by an attorney, on behalf of, and in the names of the churchwardens, it would have been amply sufficient. Moreover, he contended that the question could not now be gone into; that it was totally irrelevant on two grounds: first, that the minute-book was conclusive evidence of the appointment of the inspectors. The Act of Parliament made the minute-book evidence, and upon the face of that book it appeared that Mr. Oakeshot had been appointed to the office rendered vacant by the refusal of Mr. Baxter to act. The second ground was, that where a person had acted as a public officer in a parish, the mere acting was sufficient, and the validity of his appointment could not be questioned upon a proceeding of this nature. The only remedy which any person aggrieved had, if such there were, was by *quo warranto*. In a recent case before the Queen's Bench, in which he himself was engaged as counsel, this doctrine was laid down by Mr. Justice Crompton in so many words. There an attempt was made to upset a rate upon the ground that one of the officers of the chapelry or parish had not been properly elected, and the Court of Queen's Bench unanimously decided that the question of the validity of the appointment could not be raised in that way. With regard to the previous notices, he (Mr. Woollett) considered that he had not been fairly dealt with by his friend. It seemed to him that it was not sufficient for Mr. Rooke to object that the notices did not follow the Act of Parliament; he ought to have pointed out how they differed.

The CHAIRMAN said it was clear, from a perusal of them, that they did not follow the words of the Act of Parliament; but he should like to hear from Mr. Woollett the grounds upon which he argued that it was not necessary that they should do so. The question appeared to be whether the effect was the same.

Mr. ROOKE said his point was that the notice convening the meeting did not follow the requisition, and that neither were in accordance with the Act of Parliament.

Mr. WOOLLETT said the Act prescribed no form of requisition which could be followed. It simply stated "that from and after the passing of this Act, upon the application in writing of three or more of the ratepayers of any parish," the churchwardens should call a meeting.

The CHAIRMAN: But it gives you the words, "for the purpose of determining whether the provisions in this Act contained shall be adopted and carried into execution in the said parish."

Mr. WOOLLETT said that referred to the notice issued by the churchwardens, and not the requisition to them. The requisition in this case was in these words: "We the undersigned, being ratepayers of the parish of East Barnet, most respectfully request that you will call a public meeting of the ratepayers of this parish, to take into consideration the propriety of adopting the Act of Parliament passed in the reign of His late Majesty William IV. (August 28, 1833), relating to the lighting and watching of parishes in England and Wales, so far as relates to the lighting of the roads and streets of this parish." How did that differ from the language of the Act? It seemed to him completely to carry out, and almost in words, the meaning of the Act, although he would contend that it was not necessary there should be identity of language. The spirit of the Act was what they had to see was carried out.

Mr. STAPYLTON said the notice convening the meeting did not at all follow upon the requisition, and the question was whether the ratepayers would know what was going to be done.

Mr. WOOLLETT said the notice was in these words:—"Notice is hereby given, that a public meeting will be held in the lecture-hall, New Barnet, on Tuesday, the 18th inst., to consider the question of lighting the parish of East Barnet with gas from the works at New Barnet, a requisition to this effect having been made to the churchwardens. The meeting will commence at seven o'clock." The question was, there being no form prescribed in the Act, whether this was a sufficient notice to the public.

Mr. STAPYLTON: Does it show whether the lighting was to be paid for by a rate or by voluntary contributions?

Mr. WOOLLETT submitted that the churchwardens, acting as such, could only proceed under the authority of an Act of Parliament, and that it would be sufficiently understood that the lighting must be by a rate. Besides this, there had not been a single witness called to prove that he had been aggrieved by what was done; it had not even been suggested that any one had felt aggrieved. If there had been, it was for the overseers to prove it, and so fortify their refusal to levy the rate, with a sufficient and reasonable excuse. The notice convening the meeting was posted on the church-door, and it would be absurd to suppose that every one did not see it, and that the proposed meeting was not the topic of conversation throughout the parish.

The CHAIRMAN said it struck him that with such a notice a voluntary meeting might have been held to consider the expediency of bringing gas from the works at New Barnet.

Mr. WOOLLETT maintained that the words, "the churchwardens having received a requisition to that effect," was sufficient to indicate the character of the proposed meeting; the churchwardens could have nothing to do with a voluntary movement for the purpose of lighting the parish. In the absence of proof that some one had been deceived, it must be assumed that no one had been deceived. The fact of there being so few persons at the meeting was to be explained, he thought, upon the general experience that when a matter of this kind was expedient, and could only be done in one way, parishioners showed great disinclination to take any active steps themselves, relying upon others to get a proper contract made. As to the public benefit of lighting the streets and roads, there could be no question; it was equally clear that Mr. Pontifex and his partner were the only persons who could light the place; there was no chance of any competition and therefore there could be but one opinion upon the subject.

The CHAIRMAN said he did not see how the fact of Messrs. Pontifex and Skelton being sole owners of the gas-works affected the argument. The question was whether the parishioners must have known, from seeing the notice, that it was intended to put the Act of Parliament in force.

Mr. WOOLLETT argued that if any one had been deceived, he would have been present to complain. But the objection was not raised by a parishioner, as such, but by the overseers, who had a simple duty to perform, and were wholly irresponsible, even should any irregularity have occurred. If the parishioners were aggrieved, they had the power of appeal against the rate, but it would be monstrous to allow the objections now raised to prevail in favour of the overseers, who had no responsibility whatever in regard to levying the rate.

The CHAIRMAN remarked that the overseers, before levying the rate, were bound to see that it had been properly ordered.

Mr. WOOLLETT said they were not in the least responsible, having a simple duty to perform upon receipt of the orders of the inspectors. It was no legal excuse to them that there had been some informality in the earlier part of the proceedings.

The CHAIRMAN pointed out the awkward position which the overseers would be in if, complying with the orders of the magistrates, they paid the money directed by the inspectors, and afterwards found that the vestry refused to make a rate to reimburse them, on the ground that the proceedings had been irregular.

Mr. WOOLLETT maintained that the objection of the overseers was a mere technical quibble, which ought not to be allowed. The question was, whether the notice was so much of the essence of the case that, because it did not follow the precise language of the Act, it relieved the overseers from their obligation. He believed the Court of Queen's Bench would have no difficulty in settling this point. The learned counsel proceeded to deal with the other notices, repeating the arguments already used, after which he commented at length upon the evidence, and submitted to the bench that, notwithstanding some little discrepancies which appeared in the minutes, it was sufficiently proved that the resolution for adopting the Act was carried by a larger majority than two-thirds of the ratepayers present.

The CHAIRMAN, in the course of the argument, intimated his opinion that, in a meeting convened for the purpose of deciding upon the propriety of adopting this Act of Parliament, it would be necessary to take down the names of all the persons present, so that the qualification of those voting could be ascertained and the necessary two-thirds majority clearly determined. He believed also, on the authority of a decided case, that those present who did not vote must not be taken in favour of assenting to the proposition.

Mr. WOOLLETT said, if there had been any persons present who dissented, they might have demanded a poll. No poll was demanded, and, in the face of the minutes, which stated that the resolution was "unanimously adopted," they were bound to take it that there was no opposition.

Mr. ROOKE said he would briefly submit to the bench one or two propositions. In the first place, if they looked at the evidence they would see that Mr. Woollett had not proved all that he was bound to prove—viz., that two-thirds of the assembled ratepayers had voted affirmatively for the adoption of the Act. The utmost number voting for it was twelve, while upon the testimony of his own witnesses there were from 25 to 40 parishioners present. Passing to the election of the third inspector, he commented strongly on the signature by Mr. Simpson of the name of his co-churchwarden, and insisted that the 5th and 17th sections of the Act imperatively required the notice of meeting to be signed by both those officers. It being admitted that one of the signatures was not that of Mr. Dods, there was an end of the case; the thing was inoperative altogether. It had been said by Mr. Woollett that no one had been deceived by these proceedings, and that no one had complained, whereas it was in evidence that so dissatisfied were two of the parishioners that, failing in carrying a motion for an adjournment, they left the meeting. With reference to the requisition and notice of meeting, he remarked that, assuming the former to be good, if the latter had followed it there might have been some difficulty in supposing that the ratepayers would not understand that they were called together for the purpose of rating themselves. But he contended that there was no requisition of the kind stated in the notice. The truth was, Messrs. Pontifex and Skelton had laid their pipes in every direction, and the ratepayers might well imagine that it was proposed to supply gas through those mains, to be used by them or not, at their option—that it was to be a voluntary thing, not that a rate was to be made for the purpose, which would include persons residing two miles from the place where the gas was used. But the matter did not rest there. He had before him the opinion of an eminent Queen's counsel on the subject, which he proposed to read.

Mr. WOOLLETT objected to it being done.

The CHAIRMAN ruled that Mr. Rooke might read it as part of his speech.

Mr. ROOKE said it was—"That section 5 requires notice to be given of meeting for the purpose of adopting the Act, and that the notice is not good unless it specifies the purpose of the meeting; that in this case the form of the notice is quite silent as to the Act, and merely refers to lighting with gas, which might be by voluntary contribution." He submitted that on all hands the proceedings were clearly bad, and that the judgment of the bench must be in favour of the overseers.

The CHAIRMAN said the magistrates would give their decision on Monday, the 4th of September.

MONDAY, SEPTEMBER 4.

At the sitting of the court this morning,

The CHAIRMAN said the magistrates had determined to dismiss the summons, on the following grounds:—First, that the notice No. 3, by the churchwardens, without date, alleged to be the notice convening the meeting held on the 18th of October, 1864, was not such a notice as was contemplated by the 5th section of the Act, which section required them to convene a public meeting of the ratepayers for the purpose of determining whether the provisions in this Act contained should be adopted and carried into execution in the parish of East Barnet. Second, that the notice No. 2, of the 2nd of Nov. 1864, convening a meeting for the purpose of appointing an inspector, was defective, for want of the signature by himself of the second churchwarden, Mr. Dods; and they were of opinion that Mr. Simpson could not have supposed himself authorized to sign Mr. Dods' name, as that gentleman had on a former occasion shown his dissent from these proceedings, by leaving the meeting before the resolution for the adoption of the Act was put to the vote. Third, that there was not sufficient evidence that the resolution of the meeting of the 18th of Oct. for the adoption of the Act was assented to by the votes of two-thirds of the ratepayers present at such meeting, as required by the Act. It appeared to them also that, even supposing the above objections did not exist, at the time the order was made upon the overseers, the treasurer appointed by the inspectors had not given such security for the due execution of his office as the 25th section required, and therefore there was, in fact, no legal treasurer to receive the amount had it been levied. On all these grounds, the summons was dismissed.

Mr. WOOLLETT applied for a case upon which to go to the Queen's Bench, which, after some conversation, was agreed to.

Mr. ROOKE applied for costs, but the bench declined to make an order on the subject.

At a subsequent period of the day, Mr. WOOLLETT stated that, after consultation with his clients, it was thought advisable to abandon the case which had been asked for, and stated that any future proceedings which might be taken would be in the nature of an application to the court for a *mandamus*.

Miscellaneous News.

RATCLIFF GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of Proprietors of this Company was held on Tuesday, the 22nd of August, at the Company's Offices, New Crane, Wapping—SAMUEL FOULGER, Esq., in the chair.

The SECRETARY (Mr. H. J. Baddeley) read the notice convening the meeting, and the corporate seal of the company having been affixed to the register of proprietors,

The SECRETARY read the following report and trade account:—

Your directors have much satisfaction in laying before you their half-yearly repor and accounts to 30th of June last, duly certified by the auditors.

During the six months the directors have expended, in the purchase of freehold land and extensions, the sum of £9294. 19s. 1d., but this amount includes the purchase-money paid to the freeholders, and other expenses consequent upon the conversion of a large portion of your leasehold into freehold property, to which especial reference has been made in former reports.

Improvements have been at the same time effected in the existing premises, and the increasing demand for gas will necessitate other important alterations. In anticipation of such an event, the directors have determined to enlarge the site upon which the factory stands by the removal of the company's offices to a more convenient position in their parliamentary district, and they have also been enabled to secure possession of water-side premises contiguous to the works for a term of years, which will materially facilitate the operations of the company during the winter months.

The directors, in conclusion, recommend that a dividend for the half year ended June 30th, 1865, upon the paid-up capital of the company, after the rate of £10 per centum per annum, with 5s. 4d. per share in augmentation of the dividend paid for the year 1860 (making together £1. 5s. per share, free of income-tax), be now declared payable in one warrant, on and after the 1st day of September next.

Dr. *Trade Account, for the Six Months ended June 30, 1865.* *Cr.*

	£	s.	d.		£	s.	d.
To Directors allowances	400	0	0	By Gas-rental	14,664	9	0
Salary of secretary and clerks	395	0	0	Less bad debts and allowances	78	9	11
Collectors commission and pay	187	13	0		13,985	19	1
Rent, rates, and taxes of offices	50	0	0				
Stationery, printing, and general charges	157	3	3	Public lighting and under contracts	2,062	7	0
Payment to auditors	15	15	0	Rental of meters	5	0	2
Coals, including carriage, dues, &c.	7,357	17	10	Sale of old materials	56	15	11
Purifying materials	320	15	9	Coke	3,427	10	8
Supervision and labour	2,963	7	10	Breeze	179	3	2
Tools and other implements	104	17	8	Tar	511	19	10
Ordinary repair and maintenance of premises	897	11	2	Ammoniacal liquid	107	12	6
Rents, rates, and taxes of manufactory	391	7	10	Miscellaneous receipts	136	19	6
Distribution—ordinary repair and maintenance	99	10	7				
Meters—restoring and replacing	5	17	0				
Law and parliamentary charges	59	16	2				
Interests on borrowed capital	124	12	8				
Net profit	6,942	2	1				
	£20,473	7	10		£20,473	7	10

The CHAIRMAN said: Gentlemen, the report and the accounts having been read, it becomes my duty to move their reception and adoption. Before, however, I do so, I shall occupy your time with only a very few remarks. They will necessarily be brief, because the fact is that I have little to tell you but what is contained in the report itself, and that little I have great pleasure in believing will be acceptable to the shareholders. I feel quite sure it must be as satisfactory to you to know, as it is to the directors to be able to state, that the working operations of the last half year have been such as to enable us again to give you the maximum dividend allowed by that Act of Parliament by which all the metropolitan

gas companies are now governed. The greater portion of the report, as you will see, is taken up with what has been alluded to by myself at former meetings – namely, that the larger part of your works is now your own freehold, and you are on your own property. We have also told you that we have been enabled to secure some water-side premises, contiguous to our own—in fact, next door. The very moment that we became aware that such property as that was in the market, we thought it was too important to be passed over. At all events, we considered that if it belonged to anybody, it ought to belong to us, and we lost no time or endeavour in order to secure it. In that we have been successful. It is on lease for 21 years, and I feel that this is an important addition to our works. It consists of a very excellent wharf, standing on a large plot of ground, which will enable us to bring up our ships in a very different manner from that which we have been hitherto obliged to do, and I hope it will enable us to reduce our working expenses. There are no bricks and mortar on it, and if we can use it for nothing else, we can utilize it as a coal-store with advantage. Altogether it must be an important acquisition, and I am quite sure the shareholders will think we have done right in securing it. I am happy to tell you that our district continues without complaint, and I may add that no effort of ours will be spared to secure so desirable a condition of things. We have a double duty to perform, the one to maintain the interests of our proprietors, and the other to do justice to our consumers. To that end our efforts are directed, and I hope we shall continue to be, as we have hitherto been, successful, and that satisfaction will be the condition of both parties. With these few remarks, being most willing and happy to answer any questions that may be put to me by any proprietor, I beg to move that the report and accounts which have been read be received and adopted.

Mr. SANDER (deputy-chairman): I beg to second that motion.

Mr. PITT: With regard to the loan upon which we are paying interest, may I ask whether there is any occasion for us still to be under the pressure of that loan?

The CHAIRMAN: Only till the time when we can pay it off.

Mr. PITT: Considering the call which has been made, and the amount which has been realized by that call, I thought we might have got rid of it.

The CHAIRMAN: It is not advisable to be in debt if we can get out of it.

Mr. PITT: Is it still advisable to remain under the obligation of a loan? I should have thought we should have had a surplus which would have rendered a loan unnecessary.

The CHAIRMAN: The call has realized £10,000, and we have paid upwards of £9000 out of it.

Mr. PITT: What is the amount of the loan, and the rate of interest paid upon it?

The CHAIRMAN: About £4000, and we pay 5 per cent. The loan has been contracted for some time, and the lenders are not anxious to have it paid off.

Mr. PITT: It seems to me to be expedient that that loan should be liquidated. A respectable company like this ought not to be in debt.

The CHAIRMAN: In all probability, instead of paying off, we shall want to borrow more.

Mr. PITT: No doubt the directors see the necessity of the loan; otherwise it would not remain.

The CHAIRMAN: There would be no advantage in paying it off to-day and borrowing again to-morrow.

Mr. PITT: No doubt it is sometimes profitable to borrow money.

Mr. KELDAY: You have borrowed money at 5 per cent., and make 10 per cent. on it.

Mr. LAMBERT: There is scarcely a company in London that has so small an amount of borrowed money. It is scarcely 4 per cent. upon the capital.

Mr. KELDAY: I rather think the judgment of the directors has been wisely exercised in suffering that loan to remain as it is, while they have traded with the money and produced such a result as has been presented to the meeting to-day. I, as an individual, have got some private matters which concern me materially, as some of the directors know, which would make it very desirable to see it paid off; but I feel that the directors have been quite justified in suffering it to remain in its present state. I hope we shall be satisfied, while we can divide a dividend such as that which has been declared to-day, to suffer this debt to remain, because whenever the time comes to make it expedient to pay it off, the money will be forthcoming.

Mr. PITT: What has been asserted by Mr. Kelday does not alter my opinion one jot. If a board can do without a loan of £4000, it is well to do so.

The CHAIRMAN: There is no doubt about that.

Mr. NUTTER: You do not borrow money for the amusement of the thing.

The CHAIRMAN: Oh, no! Instead of paying this off, I feel quite certain we shall have to borrow more, but we shall not borrow it unless we feel that it is desirable to do so.

The resolution for the adoption of the report and accounts then passed unanimously.

Mr. GOODHART: I have great pleasure in proposing that a dividend be declared at the rate of 10 per cent. per annum, and 5s. 4d. per share for back dividends, making together 25s. per share, free of income-tax, for the half year.

Mr. BADDELEY (a director): I second that motion with much pleasure.

Mr. TAYLOR (auditor): Gentlemen, allow me to call your attention to one fact. In receiving your dividend as proposed, you will have to borrow a portion of the money required for that purpose, which is not a correct way of doing business. I should recommend in future, instead of receiving your dividends in March and September, that you should have them a few weeks later in order to avoid any borrowing. It is a matter for you, gentlemen, as shareholders. As a commercial man, it appears to me not a correct way of carrying on business.

Mr. KELDAY: I entirely concur in the observations which have been made by Mr. Taylor. I know it is the practice in other companies not to pay dividends till the month of October, although they are declared up to June; and I confess I have been rather surprised to see this company in a situation to pay so promptly. I was not aware we were paying for the accommodation, and I hope that the suggestion which has been made by Mr. Taylor will be concurred in.

Mr. PITT: I entirely agree with what has been said by Mr. Taylor, and think that it will be expedient to realize the assets of the company prior to dividing the dividends.

The CHAIRMAN: I can assure you, gentlemen, that the directors are very much obliged to Mr. Taylor for calling attention to this matter, which has given the directors considerable anxiety. Before I became a director of this company, it had been the custom to pay your dividends at the table. Your late chairman, Mr. Hammack, felt it to be an inconvenience, and more than once alluded to it. It must be evident that if we are not allowed time to collect our debts, we must borrow money from somebody; and our bankers, I am happy to say, are always very ready to lend. I believe we are the only company in London who do pay the dividend so promptly. The Commercial, our next-door neighbours, do not hold their meetings till October, at which time they declare a dividend up to June; and the City Gas Company have already declared their dividend to June last, payable in October next. It is a matter quite in the hands of the proprietors, though the directors have felt some little hesitation in broaching it. It will only make a delay once, and I am sure we are greatly indebted to Mr. Taylor for calling our attention to it.

Mr. KELDAY: Let it come up in the report of the directors on the next occasion.

The CHAIRMAN: I think that will be the better plan, and from this time we shall consider the shareholders are of opinion that the dividend had better be paid a few weeks later.

The resolution then passed unanimously.

Mr. KELDAY: I take the liberty of proposing that the best thanks of this meeting be presented to our chairman and the directors for the attention which they have paid in conducting the business of this company for the past six months. I think the result which has been declared to-day requires no comment. The chairman said very properly, when he began, that he had but little to tell you, because the report tells a great deal in a few words. He has told us that the property we stand on is our own; that the board has taken advantage of circumstances which arose to obtain possession of premises which will greatly facilitate the carrying on of our business; and I think, from the manner in which they have conducted the concerns of this company during the past six months, it is very evident that they have attended not only to their own interest, but to that of the proprietors at large.

Mr. THOMPSON: I beg very cordially to second the motion which Mr. Kelday has moved.

The resolution passed unanimously.

The CHAIRMAN: On behalf of the directors and myself, I beg to thank you for the compliment you have paid us, and I am especially obliged to my friend, Mr. Kelday, for the kind manner in which he has placed the motion before you. As I have said before, our efforts are directed to do the best we can for our proprietors and justice to the consumers I am very happy to listen to the conversation which has taken place to-day, because the result proves that the proprietary are one with the directors in their desire to carry out our undertaking beneficially for all. I hope we shall never have a less favourable meeting than this.

Mr. PITT: I will now, with your sanction, move that our best thanks be accorded to our excellent secretary. It must be manifest to the minds of all reflecting men that the board of directors, however able they may be, and however close they may apply themselves to our interests, without the aid of an excellent secretary, cannot carry the thing on with facility or profit. I am quite sensible that Mr. Baddeley is endowed with a vast amount of ability as secretary in every shape and form. He is quite master of the accounts, and that is a particular feature, because it is not usual for the secretary to be the accountant. I need not tell you, I am sure, that he acquits himself in the most able manner in all respects. His ability in all matters in connexion with all the affairs of this company stands so very high that it is not necessary for me to add anything further, because it has been very manifest for a length of time.

Mr. FAIRCLOUGH (auditor): Gentlemen, I have very great pleasure in seconding the motion, and can testify to the very able way in which the accounts are kept. My colleague and myself have gone through them, from the cash-book to the balance-sheet, and we have not been able to detect a single mistake.

The CHAIRMAN: I have great pleasure in putting the motion before you, and can only say that what has been said of the secretary quite coincides with the feeling of the directors.

The resolution passed unanimously.

The SECRETARY: Mr. Chairman and gentlemen,—I am very much obliged to you for this renewed evidence of your goodwill towards me. When I became your secretary you accepted me upon trust, and you were then kind. I have been five years in your service, and I appear not to have forfeited your good opinion. I am very much obliged to you.

Mr. NUTTER: The observations which have fallen from one of our auditors plainly show that they well investigate the accounts. I think Mr. Taylor has placed that matter of interest before you in a very proper manner, and I think from what I have observed of the meeting that the proprietors generally coincide. It seems to me a most extraordinary thing to have to pay interest for money in dividends, when in the course of a few weeks that money will be in hand, and I cordially agree with Mr. Taylor's remarks. No doubt the accounts are so lucidly placed before the auditors that they have not that arduous searching out of every individual matter which otherwise might be the case. Still it is evident, from the manner in which they have performed their duties, that they are entitled to our best thanks, and I hope and believe you will accord them.

Mr. J. SANDER, jun.: I beg to second the motion.

The resolution passed unanimously.

Mr. TAYLOR and Mr. FAIRCLOUGH briefly acknowledged the compliment.

Mr. PITT moved a vote of thanks to the engineer for the manner in which he acquitted himself in the performance of his duties, and said Mr. Wilton stood pre-eminently high in his scientific operations with regard to the welfare of the company.

Mr. IVES seconded the motion.

The CHAIRMAN: We have a very excellent engineer, and his practical talent is equal to that of any engineer in the land. He manufactures our gas well, and I am happy to tell you that we have no fault found with it.

The resolution passed unanimously.

Mr. WILTON briefly acknowledged the vote, and the usual compliment to the chairman concluded the proceedings.

DIED, on the 23rd ult., at 82, London Road, Brighton, after many years of patient suffering with internal cancer, Mr. WM. BARNETT, gas engineer, aged 62.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTHS OF JULY and AUGUST, 1865:—

Maximum light estimated by sperm candles according to the Act	15·8
Minimum light—sperm candles	12·0
Average light—sperm candles	14·6
Traces of ammonia, indicated by turmeric test-paper	Constantly.
Traces of sulphuretted hydrogen, indicated by lead test-paper	None.

The illuminating power has been maintained. No trace of sulphuretted hydrogen has been detected; but ammonia is constantly present in excess of what is permitted by the Act.

WESTERN GAS COMPANY.

A General Meeting of the Proprietors of this Company was held at the Company's Offices, No. 25, Argyll Street, Regent Street, London, on Thursday, the 24th day of August last—F. W. RUSSELL, Esq., M.P., in the chair.

The SECRETARY read the notice convening the meeting, and the seal of the company having been affixed to the register of proprietors, the following report was read:—

The directors have the pleasure to submit to the shareholders the usual statements of account for the year ended the 30th of June last, and to report that, compared with the previous year, the gas and meter rental has increased by £8030, the returns for coke and other products by £3148, and the total income of the company by £11,178.

Of the profit on the twelvemonth's working, after deducting interest on loans, and the first half year's dividend, there remains to be appropriated the balance of £18,839. 10s. 8d., which admits of a further dividend being paid of 5s. per A, 2s. 6d. per New B, and 1s. 6d. per C share (to make, with the payment in March last, £10 per cent. in respect of the year), and of 9s. 3d. per A share, and 4s. 7½d. per New B share being distributed in respect of past dividends of less than £10 per cent. The dividends below that rate in former years will then have been made up as far as is authorized by the Metroplis Gas Act, and a surplus of £277. 0s. 8d. will remain to be carried to the next year's account.

The directors therefore recommend the meeting to declare, for the second half of the company's financial year, a dividend (less income-tax) of 14s. 3d. per A share (£10 paid), of 7s. 1½d. per New B share (£5 paid), and of 1s. 6d. per C share (£2 paid at the date of the accounts).

In accordance with previous intimations, the reduction in the price of the company's gas from 6s. to 5s. 6d. per 1000 cubic feet, took effect from Lady-day last; and the directors believe that the operation of the Metropolis Gas Act in securing to the company exclusively the rapidly increasing business of its district, will soon render it unnecessary to maintain that price.

Messrs. Vandeleur Benjamin Crake, Lightly Simpson, and William Strode, directors, and Mr. Thomas Ford, auditor, retire by rotation, and respectively offer themselves for re-election.

The directors recommend that the nominal capital of the company should be increased from £400,000 to £600,000, and will submit to the meeting the necessary "special resolutions" for the creation of 20,000 additional shares, to be issued at such time or times as the directors may determine.

The subjoined accounts were taken as read:—

Dr. *General Balance-Sheet, for the Year ended June 30, 1865.* *Cr.*

To Proprietors capital, viz.:—				By Permanent investment		£315,474 3 9
20,000 A shares (£10 each)	£200,000 0 0			Sundry debtors		25,773 19 7
10,000 new B's (£5 paid)	50,000 0 0			Stock in trade		6,964 9 5
10,000 C's (£2 paid)	20,000 0 0			Cash in hand		10,043 13 2
		£270,000 0 0				
Received on account of £1 call due 1st prox., on class C shares		4,025 0 0				
New B share loan account	£ 6,960 0 0					
Bonds and debentures	41,500 0 0					
		48,460 0 0				
Sundry creditors		16,567 15 0				
Unclaimed dividends		297 19 4				
Leasehold redemption-fund		66 6 11				
Profit (balance to be appropriated)		18,839 10 8				
		£358,256 11 11				£358,256 11 11

Dr. *Capital Statement, June 30, 1865.* *Cr.*

To Expenditure to June 30, 1864, as per former statements		£318,668 15 9		By Share capital, &c., to June 30, 1864, as per former statements		£278,241 2 7
Expended from July 1, 1864, to June 30, 1865, viz.:—				Call on new B shares, due July 1, 1864	£10,000 0 0	
Works extension on freehold	£ 388 0 4			Less received before that day	3,198 0 0	
Ditto on leasehold	18,398 19 9				6,802 0 0	
Main-pipes £732 3 7				Call on class C shares, due Jan. 2, 1865	10,000 0 0	
Laying 441 8 9				Receipts on account of class C call, due 1st prox.	4,025 0 0	
	1,173 12 4					£299,068 2 7
Service-pipes £300 8 9				Loans at this date		48,460 0 0
Laying 309 8 9						
	609 17 6					
Reinstating roads	299 19 2					
Meters £1,569 13 4						
Fixing 110 7 4						
	1,680 0 8					
Lamp-posts and lamps account	34 16 3					
Office premises and furniture	619 13 10					
		23,204 19 10				
Balance		5,654 7 0				
		£347,528 2 7				£347,528 2 7

Dr. *Revenue Statement, June 30, 1865.* *Cr.*

To Coal		£38,077 10 6		By Gas	£91,798 0 10	
Supervision and labour		8,040 6 7		Meter-rental	2,427 10 8	
Water, oil, and sundries		1,195 13 6				£94,225 11 6
Works renewal		3,827 14 0		Coke	£4,966 3 3	
Restoring pipes and meters		1,264 19 0		Breeze	1,852 9 7	
Lamp lighting		1,410 18 2		Tar	2,743 0 4	
Repairing lamps		346 6 11		Gas-liquor	11 5 0	
Direction and audit		1,330 0 0				9,572 18 2
Salaries		3,381 4 6				
Collector's commission		1,101 9 5				
Rents, rates, and taxes		1,186 2 3				
Stationery and printing		274 6 0				
Incidental expenses		1,895 15 8				
Bad debts		388 3 6				
Leasehold redemption-fund		25 0 0				
Profit of year to June 30, 1865, carried to profit and loss account		40,052 19 8				
		£103,798 9 8				£103,798 9 8

Dr. *Profit and Loss Statement, June 30, 1865.* *Cr.*

To Interest on loans		£ 2,358 17 6		By Balance from June 30, 1864	£22,145 8 6
First half year's dividend (declared March last)		19,500 0 0		Less dividend declared September, 1864	21,500 0 0
Balance to be appropriated		18,839 10 8			£ 645 8 6
				Revenue account (profit of year, to June 30, 1865)	40,052 19 8
		£40,698 8 2			£40,698 8 2

The CHAIRMAN then said: Gentlemen, I am very happy to say that until I come to the creation of new share capital, I shall have little more to do than repeat the words that I have used on a former occasion. I am proud to be able to state that the progress of this company has been steady and quite equal to our expectations. We have realized all which we hoped to do in our rapidly increasing district. I am also proud to state that the conduct of the officers of this company has been such as to entitle them to our full approbation; for we are enabled, by the manner in which the accounts have been prepared, to come before you at this early period, the 24th of August, and to give you what I trust you will think a satisfactory account of the whole year, which we were not able to give you till the 29th of the following month in the year which has passed. That is the best test I can offer you of the efficient manner in which the duties of our officers have been discharged. Gentlemen, we are far advanced in the erection of a building which I think you will have every reason to be proud of. We have one of the finest retort-houses in the kingdom, which, whether as regards the manufacture of gas upon economical terms, or annoyance to our neighbours, or securing the health of our workmen, will, I am sure, stand unrivalled. I am certain that any shareholder who wants to see what a really fine work is, if he will only take the trouble to go to Kensal Green and inspect it himself, he will return pleased and satisfied with the manner in which the engineer of this company has laid it out. Gentlemen, we were not able to pay you back dividends the last half year. The law did not permit us to distribute any surplus profits amongst the unfortunate shareholders who for so many years were deprived of dividends altogether, and many more of their full dividends. Accordingly we took the entire of the earnings of profit in the last half year, and applied them as dividends as to which the law did not offer any impediment. We paid you nothing for back dividends, but we shall have a smaller sum on account of dividends to pay you in order to make up the 10 per cent., and the balance will be carried forward. That will explain to some gentlemen who are holders of C shares how it is they receive only the same amount of dividend which they received the last time. They are not in the same favourable position as those who have "borne the burden and heat of the day." Gentlemen, in point of form we must conclude the proceedings of this meeting before we go into the question of new capital, and I therefore move—"That the directors report and the accounts before the meeting be received and adopted."

Sir H. TAYLOR: I beg to second that.

Mr. BOX: I do not know whether I shall be in order if I make a motion with regard to having the accounts submitted half yearly, as is done in almost all other companies. I may be told that any proprietor can see them by going to the office; but it is not every shareholder who has the time to do that, and I should like to see the accounts half yearly instead of annually.

The CHAIRMAN: I do not know that there is any material difference, but any shareholder can see them at any time he pleases.

Mr. BOX: We could call at the office if we had them printed, and could then put the questions which we desired to ask, better.

Mr. GREY: I am not aware that there can be any serious objection to adopting the plan which has been suggested by Mr. Box. It would be a convenience to the shareholders to receive the accounts half yearly.

The CHAIRMAN: I do not see that there is any objection to it. There may be a little more expense in printing. I think the suggestion of Mr. Box can be complied with the next half year.

Mr. MAUGHAN: The practice is almost universal to submit the accounts half yearly.

The CHAIRMAN: It shall be done the next time. We have got full powers to do it, and we shall do it.

Mr. GRIFFITH: I think the whole thing has been so well conducted, that we had better leave well alone.

Mr. BOX: I think we had better go on from good to better.

The CHAIRMAN: All we want is to find what is your wish.

Mr. BOX: I do not want to put a formal motion.

The CHAIRMAN: I may state that, in conformity with the desire expressed by the shareholders who have offered an opinion upon the point, it is our intention that the accounts shall be presented half yearly; but if any shareholder thinks that is an unwise concession, and will move that the system pursued up to the present time be persevered in, I will put the motion; but, perhaps, that had better be deferred for a short time.

The motion for the adoption of the report was then put, and carried unanimously.

Mr. WIGGINS: With regard to the publication of the accounts, I move that things be continued as they are.

Mr. SLATER: I beg to second that.

The resolution was then put, and carried by a large majority.

The CHAIRMAN then moved—"That, on the recommendation of the directors, a dividend, less income-tax, be declared, of 14s. 3d. per A share, 7s. 1½d. per New B share, and 1s. 6d. per share to be paid to the shareholders now appearing on the company's register."

The resolution was carried unanimously.

The retiring directors and auditor were then re-elected.

Mr. BRICKWELL: Gentlemen, I think we have a duty to perform as regards our auditors. There is no doubt as to the accuracy with which our accounts are presented, and I think we should be unmindful of our duty if we did not give our auditors an adequate remuneration. I was surprised to find that the salary they at present receive is only £40 a year; and I think we should increase the stipend of each auditor from £40 to £60 a year.

Mr. SLATER: I second the motion, and think that the sum which has been proposed is really the least which we could give to our auditors.

Mr. GRAY: I do not desire to disparage the services of our auditors, but I may add that the remuneration generally given by other companies is £50, and I see no reason for departing from that course.

Mr. BOX: Having been an auditor, and still being one, of a gas company, I may say that the remuneration there is £50 a year, and we are very well satisfied. As we are on the decrease in the price of our gas from 6s to 5s. 6d., with an intimation that it may be lowered 6d. very soon, I think we should not be too prodigal, and therefore am of opinion that £50 a year would be a fair remuneration.

A PROPRIETOR: As we are about to increase our capital, and therefore to increase the duties of the auditors, I do not think £60 a year too much.

After a short discussion, the resolution passed unanimously.

The CHAIRMAN: Gentlemen, the ordinary business is now gone through, and we approach the increase of capital. One great difficulty that gas companies in London have had to contend with has arisen from their form of organization, which has conferred upon them powers that are constantly attended with difficulty, and interfere materially with their free action. No doubt, to a certain extent, we gain, because we get a right to open up the streets as we think fit, upon restoring them to the state in which they were before. But wherever a company has found the original capital insufficient, and has gone to Parliament, I must say that Parliament has not acted with very much liberality, and I am very strongly inclined to think that they have acted with bad policy towards the gas companies. At any rate, when a gas company goes to Parliament for powers, it is always treated as if it were an enemy instead of a friend to the community at large. We are treated as if we were exacting a tax without giving any equivalent for it; and, instead of the Legislature assisting us in our operations, they throw every impediment in our way. All the gas companies complain of it, and I think with some justice. Gentlemen, we have the power of increasing our capital, and, looking at the present state of the law, and the difficulties which may arise, it has been the feeling of this board that before any alteration should be made in that law we ought to avail ourselves of it, and strengthen our position, so that if hereafter there should be any change in the demands upon this company, we may be in a position to feel ourselves able to undertake them, and not fall short for the want of means. Under these circumstances, I have to move that the nominal capital of this company be increased from £400,000 to £600,000, but it does not at all follow that we are compelled at once to raise that money. We shall have that in reserve and know where to go for it. We propose to create these shares by a deposit of £1 per share. Gentlemen, I have been told that the holders of certain other shares which have not been fully called up—namely, the B and C shares—have regarded, owing, I think, to imperfect information, with some jealousy this creation of new capital, fearing that it might interfere with the calling up of those shares, because our shareholders, happily for us, are not persons who dread a call: on the contrary, they rejoice to get notice of it. Whilst other shares go down in value when a call is made, ours rise in value; and the holders of B and C shares are afraid that we may be postponing the day of happiness. If we create these shares we do not think that would be fair to the holders of these shares, and we think it would be but justice to let the whole of the uncalled capital be called up to make the shares similar to the A shares before we proceed to make a call upon the shares we now propose to issue. I shall therefore propose—"That there shall be and are hereby created 20,000 additional shares of £10 each, of the aggregate nominal amount of £200,000 in the capital of this company, increasing the capital from its present amount of £400,000 to £600,000."

Sir H. TAYLOR: I beg to second that.

The resolution was carried unanimously.

Resolutions to the following effect were also unanimously carried:—

"That the 20,000 additional shares shall be distinguished as D shares."

"That a deposit of £1 on every new share shall be paid on the acceptance thereof."

"That no call of any further sums shall be made on the new shares until the total amount of £10 per share, uncalled, shall have been called on the New B and the C shares."

"That no call on the new shares shall exceed £2 per share, and three months, at least, shall be the interval between the day appointed for the payment of successive calls."

"That within the foregoing limits the calls on the new shares shall be paid at such times, and of such amounts, as the board of directors shall from time to time determine."

"That the board of directors be, and are hereby, authorized to issue all the new shares at one time."

"That the new shares shall in the first instance be offered by the board of directors at par to the shareholders, in the proportion as nearly possible as the board find convenient to the number of their respective shares, and each new share so offered, if it shall not be accepted by the shareholders within such a period, not less than 21 days, as the board shall prescribe, shall be offered in like proportions by the board at par to the shareholders who accept the first offer and request a further allotment."

"That the board of directors be, and are hereby, authorized to issue at such times and to such persons as they shall think fit, all or any of the new shares not accepted by the shareholders, and to issue them at or above par, but not below par, except with the sanction of a resolution of a general meeting of the company."

"That the board of directors be, and are hereby, authorized to carry the objects of the preceding resolutions into effect, at such times and in such manner as they in their discretion shall think best for the interests of the company."

The CHAIRMAN: Gentlemen, that concludes the business, and I hope when we next meet I shall have to report to you as satisfactory a state of our affairs.

Mr. GRAY: Gentlemen, I am quite unwilling that we should separate without expressing our approbation of the course which has been pursued by the directors during the past six months, and so long as this undertaking is conducted by the gentlemen who are now before us, I have no doubt we shall go on in a state of progressive prosperity. The chairman has, with very great judgment, referred to what parliamentary committees sometimes do when the poor unhappy gas companies go before them. We are treated most shamefully, and I really think that, after the imputations which have been cast upon us by some of the witnesses, instead of our being here meeting together to conduct our business we should be in some of the colonies.

The motion having been seconded, was carried amid loud cries of "All, all."

The CHAIRMAN: Gentlemen, for myself and the board of directors, allow me to thank you most cordially for the compliment which you have paid us, and I can assure you that we shall continue to endeavour to deserve at your hands a return of thanks similar to those which we have received to-day.

Mr. JACKSON: Gentlemen, the success which has attended this company, and which is no doubt owing in a great measure to the directors, is also due to the efficiency of the secretary, Mr. Barber. Therefore, without further remark, I solicit your thanks to the secretary and officers of the company.

Mr. SLATER: I beg to second that.

Mr. MAUGHAN: I have great pleasure in supporting that motion. Not only is this company under great obligation to Mr. Barber, but I believe that all the gas companies in the metropolis also owe him a great deal, because it was very much owing to his strenuous exertions that the districting of the metropolitan gas companies was brought about. My own impression is that there is no gentleman to whom in a greater measure the districting arrangements are attributable than to Mr. Barber, but I do not think the gas companies have ever properly acknowledged his valuable services in this matter.

Mr. BRICKWELL: We must not forget another gentleman to whom the prosperity of this company is very much indebted—I allude to our engineer, Mr. Pritchard. I dare say the directors duty is easily performed—they have an efficient secretary at their elbow; but what should we do without our able engineer? I should say the new retort-house surpasses everything that I have seen. Many matters perfectly independent of the designer, the architect, or the builder, are brought to bear in a manner by our engineer which is perfectly surprising, and I do think that a very large amount of the great prosperity we now have the pleasure of enjoying is to be attributed to Mr. Pritchard. Therefore I beg to couple Mr. Pritchard's name with Mr. Barber's and that of the officers in the resolution.

The resolution was passed unanimously.

Mr. BARBER: Gentlemen, I thank you most sincerely on behalf of myself and Mr. Pritchard and the other gentlemen connected with the company for the vote which you have just passed. We much appreciate your good opinion, and hope that we shall always deserve the same vote at your hands.

The proceedings then terminated.

LIVERPOOL UNITED GASLIGHT COMPANY.

The Half-Yearly Ordinary Meeting of the Proprietors of this Company was held at the Offices of the Company, Newington, on the 22nd ult.—Mr. C. MOZLEY, chairman of the board of directors, presiding.

The financial statement was read by Mr. STEEL, the treasurer.

Mr. GARNETT, the secretary, read the report, as follows:—

The directors have the satisfaction to announce that, notwithstanding the frequent reductions in the price of gas which have taken place during the last three years, the accounts and estimate of profits for the past year not only justify the declaration of a dividend of £5 on every £100 stock for the half year ending 30th of June last, but also enable the directors to recommend a still further reduction of 2d. per 1000 cubic feet in the price of all gas supplied by the company from the 1st day of July last, thus making the price to consumers within the borough 3s., and in the out-townships 3s. 4d. per 1000 feet.

At the last meeting the proprietors were informed of the necessity which had arisen for applying to Parliament for additional powers to meet the rapidly-increasing demand for gas in Liverpool and the neighbourhood.

The directors have now the pleasure to lay before the meeting the Act of Parliament which was accordingly obtained in the past session.

By this Act the company are authorized to raise further capital to the extent of £300,000, by the creation of additional stock bearing a maximum dividend of 7 per cent. per annum, to be apportioned among the proprietors; and also to borrow more money on bond to the extent of £60,000.

The necessity for providing these means to supply the future wants of the district was so apparent, that it was a matter of much surprise and regret to the directors that the Lighting Committee of the Town Council and the Tradesmen's Guild, and some other bodies in Liverpool, should think fit to oppose the company's bill before the committees both of the Lords and Commons; where, however, after full inquiry and discussion, the grounds of opposition were effectually refuted, and the bill passed both Houses in subtantially the same form in which it was first presented to the Lords committee, almost the only alteration being the insertion of some clauses relative to the quality of gas and the means of testing it, which were introduced on the requisition of the chairman of committees, although the opponents of the bill proposed that they should be omitted.

In the course of the opposition, it was suggested that the company might avail themselves of the powers sought for, to immediately raise the further capital in anticipation of their actual requirements, and thus defer any reduction in the price of gas. It is hardly necessary for the directors to say, that this apprehension was entirely needless, the intention of the board being to conduct the affairs of the company in future on the same principles by which they have been hitherto governed, and under which it is believed the public of Liverpool have derived great advantages in respect of the supply of gas than any other town in the kingdom.

The directors have acquired sites for new works at Linacre and Garston, and at the former place operations for the construction of large gas-works are in active progress, but it is not intended to issue the new stock until absolutely required, of which timely notice will be given to the proprietors.

The members of the board who retire by rotation are Charles Mozley, Henry

Booth, Charles W. Reade, and Samuel H. Thompson, Esqrs. The retiring auditor is William Drury Chidson, Esq. All these gentlemen are eligible for reappointment.

The CHAIRMAN said it was almost needless for him to make any remarks after the report which had been read, because it embraced the most salient points connected with the affairs of the company; but perhaps he might be allowed for a few moments to refer to some of the points which were alluded to therein. It was quite evident that the directors had endeavoured to the best of their ability and judgment to conduct the affairs of the company upon the same principle as had hitherto been adopted, and the best proof of the efficiency with which that principle had been carried out was the maintenance of the dividend at the rate permitted by Parliament —10 per cent.—keeping, to a great extent, the reserve-fund full, and at the same time making a reduction in the price of gas whenever an opportunity was afforded them. He thought it would be satisfactory to the proprietors to find that the dividend had been maintained, whilst at the same time the directors were able to recommend a reduction in charge to the consumers of 2d. per 1000 cubic feet. That would to a great extent, he hoped, satisfy the latter that there was no disposition on the part of the company to seek for more than they considered a fair and equitable remuneration, or to deprive the consumers of that which they consistently could afford to them. It was stated at the last meeting that the directors were about to seek for further powers. Those powers they went to Parliament for, and, notwithstanding the difficulties thrown in the way by the various parties opposing the bill, the best proof that the company required nothing but what was just and equitable, was the confirmation of the bill in its integrity by the committees of both Houses of Parliament. That, he hoped, would be sufficient to show that there was nothing unreasonable in the company seeking power to raise money in the way stated. He believed it would be found that the course adopted in seeking for land for the purpose of erecting additional works, was a judicious one on the part of the company, and one which the town itself would naturally look for. He might remark that none of the opponents of the bill ventured to state that the gas that was supplied to the public was not of the very best quality that could be given, or that the price was in any degree immoderate. They were quite ready to receive any reduction in price, but they had nothing to state in any shape against the manner in which the affairs of the company were conducted. It was said by Mr. Serjeant Atkinson, in opposing the bill, that there was no complaint with regard to the management of the company, which was extremely able; and again, Mr. Milward said he would endorse every word which his learned friend, Mr. Atkinson, had used as to the way in which the company carried on their business. There was no complaint, he said, as to the supply of gas, and he was not there to find fault in any way. Again, he (the chairman) might venture to say that there was no attempt on the part of the company to place the public in a position of doubt and uncertainty by calling up the capital unnecessarily, and thereby preventing the consumers getting the advantage of any balance that might arise on the face of the accounts. By the manner in which the affairs had been conducted, they had contrived to keep the reserve account full, and they were enabled at the same time to reduce the price of gas from the 1st of July last, the price having previously been reduced only last year, he believed. He hoped the directors would get credit for endeavouring to conduct the affairs of the company in such a way as to do justice to the proprietors who had invested their capital, and to give the consumers at a moderate price gas which could not be excelled in quality. With these remarks he begged to move—"That the report and accounts be received and adopted."

Mr. S. H. THOMPSON (deputy-chairman) seconded the motion, which was carried unanimously.

The CHAIRMAN then moved—"That a dividend at the rate of 5 per cent. on the consolidated stock of the company for the half year ending the 30th of June be declared payable to the proprietors, less income-tax, on the following day."

Mr. S. H. THOMPSON seconded the motion, which was also carried unanimously.

Mr. C. Mozley, Mr. C. W. Reade, Mr. Henry Booth, and Mr. S. H. Thompson, having been re-elected directors, and Mr. Chidson having been re-elected auditor,

Mr. J. B. BRANCKER rose to move a resolution which he said he felt confident would, as he was sure it ought to, receive the unanimous support of the meeting. He had often been struck with the inadequacy of the remuneration allowed to the directors and managers of public companies in Liverpool, when he considered the sacrifice of time required, the devotion of thought to the management of the affairs, and the great responsibility which was involved by undertaking such duties, and likewise when he compared the remuneration which directors of companies in Liverpool received with those received—to his own knowledge, and he was sure to the knowledge of many gentlemen present—by directors in London. He believed it was now in the power of the proprietors, under a clause introduced into the last bill, to increase the remuneration of the directors, and it was with the greatest pleasure that he took the earliest opportunity of proposing that the clause be put into operation. He begged to move that the remuneration to the directors for the year ensuing be £1200. In reply to a question, Mr. Brancker said the remuneration had hitherto been £500.

Mr. CHIDSON seconded the motion, which was unanimously agreed to.

The CHAIRMAN said he was sure the board would feel gratified by the confidence reposed in them.

A PROPRIETOR said that whilst the report was very gratifying to the proprietors it must be equally so to the consumers, showing them that they were really partners in the concern.

The CHAIRMAN said there was not a word of objection offered by the consumers before either committee. In fact it was almost a unanimous feeling that they assented to the proposal that was made.

Thanks were then voted to the chairman, and the proceedings terminated.

SOUTH ESSEX WATER-WORKS COMPANY.

The Ordinary Meeting of the Shareholders of this Company was held on the 22nd ult., at the Guildhall Coffee-house—Dr. SMEE in the chair.

The report stated:—"The directors in meeting the shareholders, after having seen them so recently at Grays, have but little fresh information to lay before them. They are, however, happy to state that the business of the company in the provinces has, during the past six months, slowly but steadily increased. The further development of water in the pits has been proceeded with since the visit of the shareholders, and the quantity estimated to be now daily at the disposal of the company is 6 millions of gallons. During the last few weeks the works at Grays have been visited by many gentlemen from London interested in the improvement of the metropolitan water supply, which becomes shorter each year, whilst the quantity demanded for additional houses rapidly increases. The directors submit the balance-sheet for the half year. They have, however, at present been selling only 1/30th of the water at their disposal, but the increasing deficiency in the water supply to London, more particularly at its eastern extremity, renders them more and more confident that the whole of their stock will soon be required."

The CHAIRMAN, in moving the adoption of the report, said, with regard to the district itself, the additional consumption was not so great as they anticipated. He thought they would have a far more rapid distribution in the district itself. But it was going slowly on. There was one case where they had no increase—Warley Barracks—where they were going to take the water. The railways had not taken so much water at Brentwood, because the continued rains had given a supply to the streams in the neighbourhood. He thought the proof and testimony of the public knowledge was that where large towns were supplied from the springs the sources were healthy, whilst that was not the case where towns were supplied by the river water which contained the sewage of the towns above. The Master of the Mint had inquired into this matter. He distinctly recommended a supply from those springs; and this company had the largest supply from the chalk that was known to exist about London. They had had a conference with their engineers, and they expressed a desire that they should supply that district with water. They only utilized 1/30th of the water, and they could make the company a great success, as they contemplated, when the whole of the water was used. The people on the Thames were asking for compensation for the water taken away from the river. Dr. Aiken, of Oxford, reported that the Thames contained the sewage of Oxford. They had not the means for bringing this water to London, but he thought if they could fairly get it before the public and the Government, so as not to be exposed to a parliamentary contest, the water would be brought to London. During the last six months they had gone on developing the present supply of water to some extent—they had developed 6,000,000 gallons of water. They had reason to suppose that that might be increased. But it was of no use spending money in development of the water until people came to them, and the directors did not want to spend a shilling. If this water was taken up it really was a crying shame to see so much of this water taken out of the Thames, when London might get other and better water. They feared there was a combination against them by other water companies. If they made the Government aware of its existence they might immediately get direct remuneration. They had been negotiating with some other companies; they had acted with other companies, and though urgent overtures had been made they had nothing definite to bring before them. Whatever might be the effect of the approaching appearance of cholera he was certain the people of London would be more free from it if they had pure water than if they continued to drink water from the rivers Lea and Thames after they had received sewage. He begged to move the adoption of the report.

Mr. FOWKES seconded the motion.

A short discussion followed, during which it was stated the income of the company was £1200 a year.

Thanks were voted to the chairman, and the proceedings terminated.

THE ILLUMINATIONS AT PORTSMOUTH.—No sooner were the preliminaries arranged for the reception of the French fleet at Portsmouth, than an order was issued by the Admiralty to Messrs. Defries and Sons, of Houndsditch, to prepare for an illumination of unprecedented brilliancy. A telegram was despatched to their establishment, with brief instructions for that purpose, and immediately they mustered a staff of 500 men, all of whom, under their personal superintendence, were forthwith at work hastening the execution of their contract. The result proved that short notice is no hindrance to a successful issue, where an experienced firm is engaged. Upwards of 300,000 lamps, in every device to which crystal can be turned, and displaying as many illuminations in the national colours of France—the popular red, white, and blue—gave such an artificial glare to Portsmouth as no city or town in England has ever yet revealed. The effect was, moreover, greatly heightened by the interspersion of innumerable flags, both French and English, by unmistakeable assurances of cordiality in thousands of banners bearing our true Saxon expression of "Welcome," Chinese lanterns, and all the auxiliaries which such occasions call into service. The outlines of all the public buildings and mansions, together with most of the private houses, were delineated by as many gas-lights as would serve to illuminate a large provincial town for the winter season. The streets, walls, and promenades likewise shared in the same liberality of a supply of gas, with countless jets and burners to display its glaring beauty, and which, with the reflection caused by tricoloured fires, floods of the marvellous "lime-light," all intensified in their effect by corresponding illuminations on board every vessel in the harbour, have left in Portsmouth such a memento for congratulation as will make the visit of the French fleet the most joyous event that the denizens of our great maritime town have ever experienced.

VENTILATION.—Mr. Henry W. Reveley has addressed the following observations on General Morin's paper on this subject to the *Journal of the Society of Arts*:—"The note in your last number on this subject does not lead to any very decided solution of the great problem of how to keep down the temperature of public buildings, or how to furnish a dense crowd with pure air without introducing disagreeable or even dangerous draughts. All the endeavours of General Morin confessedly failed, and the double envelope proposed by M. Regnault would only have the effect of slightly lowering the internal temperature when the building is exposed to the intense heat of the sun, in no way conducing to the supply of pure air, and a mode of construction that would be of no avail during the night hours. Continued watering of the roof is a most vicious plan, because it tends to check the natural alacrity of heated air to rise. As long as we insist on having our ceilings made air-tight with lath and plaster, or otherwise, we shall discover no real or permanent remedy for the heat, stifling air, and water running down the walls of our public buildings, a certain sign of the absence of ventilation, when crowded with human beings. Our courts of law and justice are wretched examples of either total absence of ventilation, or of such miserable expedients as amount to nothing. Their state is much aggravated because the mephitic vapour exhaled by raving counsel, anxious clients, prosecutors, criminals, and witnesses, is far greater than under ordinary circumstances. Let the ceilings be of lath only, without the plastering, and so construct the roof as to render it a ventilator throughout every portion of it, then the foul and heated air will rise bodily from the whole area of the room and disperse itself in the atmosphere, while no water will be found running down the walls into pools on the floor as I have frequently seen it. Fresh air is sure to find its way in somewhere, or at any rate a band of perforated zinc several feet broad all round the four walls of the room, at a proper height from the floor, would ensure that object. I speak from experience, having been present at a ball, given in the hottest season, in an unfinished building of which the ceilings were only lathed—not plastered—and, notwithstanding the lights and company, the atmosphere of the rooms was as cool as the outward air."

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	£5 intr.	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	£5 intr.	5 5 0
10000	5	Do., second issue	4 0 0	£5 intr.	4 5 0
10000	5	Do., third issue .	2 0 0	£5 intr.	2 7 6
5000	20	Brit. Provincial L.	20 0 0	7 10 0	30 to 30½
8200	20	Do., new . . . . (Norwich, Huntsculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	76 15 0
6000	50	Do.	30 0 0	10 0 0	48 to 48½
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30½ to 31
10000	10	Do., B shares	10 0 0	4 0 0	7¼ to 7¾
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow(L)	5 0 0	£7 intr.	3 to 3¼
17490	25	Colonial & General *Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	10 2 6
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
17490	25	*Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	10 2 6
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17¼ to 18¼
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13 10 0
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6¾ to 6⅞
20000	10	*Great Central Gas Consumers* . . .	10 0 0	10 0 0	16 to 16½
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	83 0 0
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian .	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	93 10 0
3000	40	*Independent* . . .	40 0 0	10 0 0	65 to 67
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6886	50	*London*	50 0 0	10 0 0	79 10 0
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781	*l*	Do., 1st pref. sk		6 0 0	
11828	*l*	Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	2 10 0	
30000	5	Oriental, Calcutta	5 0 0	8 0 0	5 17 6
30000	5	Do., new shares.	0 10 0	8 0 0	0 12 6
10000	5	Ottoman (Limited)	5 0 0		4 to 4¼
10000	10	Pará (Limited) . .	10 0 0	5 0 0	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 to 33⅜
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
	20	Rio de Janeiro (L).	20 0 0		20 to 20½
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4000	50	*Sth. Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15½ to 16
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35 5 0
10000	10	*Victoria Docks* . .			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	17 5 0
10000	10	Do., B shares.	5 0 0	10 0 0	8 10 0
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s. 6d
Cork	9s. 6d. to 10 0
Dover, Folkestone, and Ramsgate	6 9
Dublin	10s. 0d. to 10 6
Exeter Quay	8 6
Ipswich	5 9
London (from Leith)	8 6
London (Pool)	7 0
Lowestoft and Yarmouth	4 9
Portsmouth and Southampton	8 0
Plymouth	6 3
Shoreham	7 6
Whitstable	6 9
Weymouth	8 0

Foreign.—Per Keel:—

Barcelona	£24 10
Bordeaux	£15. to 15 10
Boulogne and Calais	8 10
Cadiz	17 10
Copenhagen	£9. to 9 10
Genoa	23 0
Hamburg	8 15
Havre de Grace	9 15
Leghorn	22 10
Lisbon	16 10
Rotterdam	£8. to 8 10
Stettin	10 5
Trieste	21 10
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2 15 0	
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 6
Ingham's ditto (at Wortley), p. 1000..	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	85 0 0
English Pig Lead, p. ton	20 10 0
Welsh Bar Iron (in London), p. ton ..	7 15 0
Foreign Spelter, p. ton	21 5 0
English Block Tin, p. ton	93 0 0
Banca, p. ton	93 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

Advertisements.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

TO GASHOLDER-MAKERS.
TENDERS are invited for the manufacture and supply of a GASHOLDER, 100 ft. diameter and 25 ft. deep, with columns and suspension-frame, for a foreign gas company.
Form of tender and specification may be obtained by payment of one guinea, on application to JOSHUA HORTON, Engineer, STOURBRIDGE.

TO GAS COMPANIES.
WANTED, by the Advertiser, a situation as INSPECTOR, or otherwise. Practically understands the distribution of gas, the laying of mains and services, gas-meters both wet and dry, and the repairs of the same, consumers fittings, and all the duties connected with a gas-work; having filled a similar situation for the last nine years in a metropolitan gas company. First-class references.
Direct to HENRY SHAW, care of Mr. Roberts, 10, New Court, Farringdon Street, LONDON, E.C.

HONOURABLE MENTION. INTERNATIONAL EXHIBITION, 1862.
CARTWRIGHT & CO.,
MANUFACTURERS OF
GASFITTINGS, BRACKETS, GASELIERS,
&c., &c.
PATENTEES OF THE ANHYDROUS SLIDE, whereby the use of Water and Heavy Weights are dispensed with.
39, 40, 41, & 42, LOMBARD STREET,
BIRMINGHAM.

WALTER MABON & CO.,
Engineers,
ARDWICK IRON-WORKS,
FAIRFIELD STREET, MANCHESTER,
MANUFACTURERS OF
IRON TANKS, GASHOLDERS,
GAS APPARATUS,
PIPES, VALVES, IRON ROOFS,
WROUGHT AND CAST-IRON GIRDERS.
DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

WATSON'S OVERTON CANNEL COAL.
THIS Coal, which yields 13,000 cubic feet per ton, is far superior to any other Scotch cannel coal (except Torbanehill) for making gas. It gives rather more than one-third of its weight in coke of excellent quality. Containing 90 per cent. of combustible matter and heat-giving material. In these respects the Overton cannel is greatly superior to the Torbanehill coal.
Orders for the above will have every attention, and shipped with despatch at the following ports:—Leith, Granton, Bowness, Charleston, Glasgow, and Greenock; and can also be delivered at any railway-station in Scotland.
For price, &c., apply to the Proprietor, JOHN WATSON, jun., 123, St. Vincent Street, GLASGOW.

TO BE SOLD, a Set of 4 Cast-iron DRY-LIME PURIFIERS, each 7 ft. 3 in. by 6 ft. 3 in., and 3 ft. 9 in. deep, with complete hydraulic centre valve, and revolving lifting-crane for the covers. Three tiers of cast perforated shelves in each, and 8-in. connexions.
The above purifiers are in good condition, and sold in consequence of larger having been substituted.
The Company have also for sale at a low price, in very good condition, a 3-horse TABLE STEAM-ENGINE.
The whole may be inspected and particulars known on application to Mr. GIFFORD, Gas Company's Office, CAMBRIDGE.
July, 1865.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

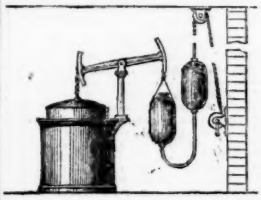
Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

CLASSES X. & XXXI.

"George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	,,	,,	2·812.
Croll, Rait, and Co.	,,	,,	5·540.
Thomas Fletcher	,,	,,	15·121.
Joseph Boulton	,,	,,	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.



By Her Majesty's Royal Letters Patent.

KEELING'S
STATION GOVERNOR REGULATOR.

N.B.—The largest Governor in the World is now being supplied (viz., 36-in. inlet) to one of the London Gas Companies. All orders to be addressed to

Mr. J. KEELING, Consulting Gas Engineer,
12, BERMONDSEY NEW ROAD, LONDON, S.E.

JOSEPH BOULTON,
PATENT DRY AND IMPROVED WET GAS-METER MANUFACTURER,
80, KING'S CROSS ROAD, AND
101, GREAT PERCY STREET, CLERKENWELL.

The superiority of these Meters over all others hitherto invented has gained for them unparalleled patronage by all the principal Gas Companies and the Trade in general, on account of their unerring registration, efficient workmanship, and the quality of the materials used in their construction.

STATION-METERS, GOVERNORS, PRESSURE-GAUGES, & EXPERIMENTAL METERS,
ON THE MOST IMPROVED PRINCIPLE.

Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament.

ALL METERS WARRANTED.

OXIDE OF IRON.
We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

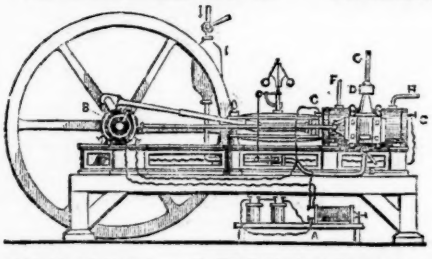
FRANCIS RITCHIE & SONS,
BELFAST.

BEST AND HOBSON,
LATE
ROBERT BEST,
100, CHARLOTTE STREET, BIRMINGHAM,
Manufacturers of
CHANDELIERS, PENDANTS, BRACKETS,
Brass and Iron Gas-Fittings, Steam and Water-Cocks, &c., &c.
Also,
[PATENT WELDED] IRON TUBES,
For Gas, Steam, Water, and other purposes.
GAS APPARATUS OF EVERY DESCRIPTION.
High-pressure Water-Valves and Cocks, &c., &c.
Plumbers Brassfoundry,
BRASS, COPPER, COMPOSITION, AND LEAD TUBES.
Works: Birmingham, and Great Bridge, Staffordshire.

LENOIR'S PATENT GAS-ENGINE.

PUBLIC

EXHIBITION,



From 11 to 1

AND

3 to 5 Daily.

40, CRANBOURNE STREET, LEICESTER SQUARE, LONDON

Manager and Secretary (pro tem.) MR. C. W. WOOD.

MANUFACTURERS, READING IRON-WORKS COMPANY (late BARRETT, EXALL, and ANDREWES).

Consumption of Gas not more than 70 feet per horse-power per hour of ACTUAL *work.*

The Gas-Engine is elegant in appearance, in construction simple; there is no boiler, generator, or accumulation of power, so that there is no danger. It is very clean and free from heat, smoke, dust, dirt, or noise. Its power is either constant or intermittent, and its cost only co-existent with its working. No skilled engineer is required. It can be instantly started, and as quickly stopped. Being light in weight, it can be worked in any apartment, or on any floor, and where steam-power would be totally inadmissible. With the leading Fire Insurance Companies it does not entail any charge for extra risk. The price of the Engines, including the necessary apparatus, is as under—½ horse-power, £65; 1 horse-power, £85; 2 horse-power, £110; 3 horse-power, £135. The usual terms to the Trade, &c.

CONTENTS.

	PAGE
Notes upon Passing Events:—	
Bessemer's Improvements in the Manufacture of Steel	681
Professor Rogers on the Patent Laws	681
Mr. Goodman's Paper on the Small Arms Manufacture of Birmingham	682
Improved Condition of the British Workman	682
Delusions of the *Revue Contemporaine* as to the Increase of Pauperism in England	683
Proposed Supply of Water to London from the Severn	683
Mr. Quick's Report on the Constant Supply of Water	683
Leading Article:—	
The Leamington Local Board and the Gas Company	683
Circular to Gas Companies:—	
Extortionate Claim on a Consumers Gas Company	686
Further Reductions in the Price of Gas in the Metropolis	687
Second Edition of Hughes's Treatise on Gas-Works	687
Register of New Patents:—	
Noone, G. E.—Deodorizing and Utilizing the Sewage of Towns	687
Jolley and Harlow—Cocks and Valves	687
Robinson, G.—Moulds for Casting Pipes, Columns, and other Articles	687
Moulié, J. J.—Treating Benzole or its principal composing Hydrocarbons	688
Croll, A. A.—Preparation of Materials to be used in the Purification of Gas for Illumination	688
Henry, M.—Carbonizing Wood and performing other Operations in which Substances are treated by Flame or Heat	688
Kissack, J.—Warming and Ventilating Apparatus	688
Sang, F.—Ventilating Cupola-Chandelier	688
White, J.—Purifying, Changing, and Impregnating Atmospheric Air	688
Greenhalgh, T.—Steam-Engines and Rotary Pumps	688
Henry, M.—Apparatus for Indicating, Signalling, Registering, Measuring, and Stopping Escapes of Gas	689
Binks, C.—Separating Sulphur from Coal and Coke	689
Gray, T. W.—Pumps	689
Brooman, R. A.—Apparatus for Heating and Cooking by Gas	689
Wilson, H.—Pumps	689
Applications for Letters Patent	689
Grants of Provisional Protection	689
Invention Protected for Six Months	690
Notices to Proceed	690
Patents which have become Void	690
Miscellaneous News:—	
New Smoothing Iron	690
A Ship Blown Up	690
Meeting of the Newcastle and Gateshead Gas Company	690
Meeting of the United General Gas Company	691
City of London Court of Sewers	692
Metropolis Gas Supply—Meeting of Delegates	692
Mr. Quick's Report to the Southwark and Vauxhall Water Company on Constant Water Supply	692
Gas Lighting in Railway and other Carriages	693
The Coal and Iron Trades of Great Britain	694
The State of the Thames	695
Gas Lighting at St. Thomas's	696
The Ottoman Gas Company, Limited	696
Galvanized Iron Water-Tanks	697
Share List of Metropolitan Gas Companies	696
Price Current	696

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, October 3, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 19, 1865.

Notes upon Passing Events.

THE Birmingham meeting of the British Association for the Advancement of Science will be rendered important if only by Mr. Bessemer's paper "On the Manufacture of Cast Steel," perhaps the most important—certainly the most useful—paper read at the holiday *fête* of the philosophers. It will be remembered that in 1856, at the Cheltenham meeting of the same association, Mr. Bessemer read what now may be called an account of the *theories* on which he had recently taken out certain patents. His paper made an immense sensation; within three weeks after the reading, licences to manufacture malleable iron, under the Bessemer patent, were purchased by ironmasters to the amount of £25,000. But although the theory was correct, there were defects in the process fatal to profitable working. The vulgar proverb of "going up like a rocket to come down like a stick" was realized in this case. The new method was thoroughly discredited, not a little to the satisfaction of the steady-going manufacturers, who stood by, did not take out licences, and exclaimed, "I told you so." Mr. Bessemer was not discouraged by temporary failure, for he saw a large reward before him if he did succeed. He set to work, and spent three years and £10,000 in amending the defects of his process. But by the time he had to a great extent succeeded, the faith of the trade had been so completely destroyed that no one would work his patents. This led the Bessemer Company to erect steel-works in Sheffield. They were able to use Mr. Mushet's large batch of manganese patents, because confidence in the improvement of the manufacture of iron had sunk so low, that it was not thought worth while to pay the £50 stamp due on them at the end of three years. The Bessemer Steel-Works "have become a school where "dozens of practical steel-makers have received their lessons "in the new art." The Bessemer cast-steel plates made for ships plates is of a very tough and ductile quality, and double the strength of the iron plates usually employed in ship-building. One Liverpool firm has constructed 31,510 tons of shipping, wholly or partially built of steel. Of these 38 vessels are propelled by steam. Beside these, the principal masts and spars of 18 sailing vessels have been made wholly of steel. A steel vessel of 1000 tons would weigh 250 tons less than one of the same tonnage of iron, and have that advantage in more tonnage, or less immersion. Two steel paddle-wheel steamers, launched at Liverpool by James Quigley and Co., on the 13th of August, for the Liverpool and Dublin service, will draw from three to four feet less water than the iron steamers of the same line, and thus be able to leave the ports at all states of the tide, and not require a tidal train in connexion with them. Reference was also made to the importance of this new material when applied to iron-plated ships of war. A plain steel axle was exhibited, that scarcely showed any wear, after having run 112,500 miles. Steel rails were tried against iron at the Chalk Farm Bridge of the Camden station, at which point there is a narrow throat from which converges the whole system of rails employed at the London termini of that station. At this spot two steel rails and two iron rails were fixed on the 2nd of May, 1862, precisely opposite each other. The result, up to July, 1865, has proved that a steel will wear out at least twenty iron rails; and there is no doubt that all companies that can afford the cost will renew their roads with steel rails.

The following figures show the progress of steel manufacture consequent on the Bessemer patents. In 1851, the entire production of steel of all kinds in Sheffield was 35,000 tons annually, of which 18,000 were cast steel—equal to about 346 tons per week. A monster ingot weighing 24 cwt., exhibited at the Exhibition of 1851, was supposed to be the largest mass of steel ever manufactured in England. The Bessemer apparatus at the works of John Brown and Co., Sheffield, is capable of producing every four hours a mass of cast steel weighing 24 tons! There are now seventeen extensive Bessemer Steel-Works in Great Britain. One, the "Barrow," can turn out 1200 tons of finished steel per week; and when their new converting-house is finished will be capable of producing 2400 tons of cast steel per week. The average price of cast steel has been reduced at least £20 per ton below the average price at which it was sold in 1851. "With the present means of "production, therefore, a saving of upwards of six millions "per annum may be effected in Great Britain alone, *and this "in the infant state of the Bessemer steel manufacture.*" In answer to a question from Mr. Bramwell, Mr. Bessemer stated that he had been able to produce his steel with one class of iron only found in this country—the *hematite*. The bulk of the iron was too much impregnated with phosphorus and sulphur. Hematite is obtained almost entirely from Cumberland, from the Forest of Dean, and Exmoor, where extensive veins still remain unworked,

On the day following the reading of Mr. Bessemer's paper, so full of facts bearing on the progress of the nation, Professor Rogers, in another room, read a paper on patent laws, which was full of nothing but assertions. Professor Rogers evidently considers that mechanical and chemical improvements are picked up by those who look for them, like nuggets of gold—

complete and ready for the smelting-pot. Either he could not alter his already written paper, or he had learned nothing from the report of the years of experiment and the thousands of pounds spent by Mr. Bessemer in reducing the price of steel by £20 a ton, and the draught of vessels by 25 per cent. "A patent," he said, was "the result "of a mere race between two or more persons, each of "whom is striving to inflict a loss upon the rest of the "world." We should be glad to know what loss the steel patents have inflicted "on the rest of the world." The supposed security and profit of patents have led to the concentration of thought and expenditure of capital in improving steel. They have encouraged perseverance after a first failure. This advantage is undoubted. It is reasonable to believe that as the whole iron and steel trade were incredulous, after the first failure, of Bessemer's success, that years would have elapsed without fresh efforts on the part of the trade. Mr. Bessemer was not in the trade, and it is clear that it was his patent that forced the new process into use. It is only on the ground of utility to the world that any right of property can be defended. At one period, in our colonies and in Spain all mines were vested in the Crown, and consequently no one took the trouble to find them. The law of Spain was altered, and with the best effects, in order to encourage mining enterprise; and in Australia with results familiar to every one. Professor Rogers dwelt on the injustice to the simultaneous inventor who was too late in applying for a patent. Such misfortunes are incident to life. A mountain in South Australia was sold to parties who, after the purchase, divided into the "Nobs" and the "Snobs;" they divided their lot into two equal portions, and tossed for choice. To the Snobs fell what turned out the Burra Burra, the richest copper-mine in the world; to the Nobs a mine that barely paid its working expenses. Thus the Nobs, who had chosen the whole block skilfully, were as unfortunate as an inventor too late for a patent. But, for want of facts, these stories of simultaneous invention may be considered as grossly exaggerated, as to number, at any rate. No important patent has ever been perfected without long and patient labour. Mr. Rogers asserts that the progress of invention is seriously hampered. We want to know where and when commercial progress was hindered by a patent. The assertion is frequent, but we do not hear of it from any really great mechanic—Stephenson the younger, Field, Whitworth, or Roberts. As for the pity expended on "the unfortunate gambler, the patentee," it may be reserved for those who need it. What greater lottery than copper, lead, and silver mining? Would it, therefore, answer public purposes to discourage these pursuits? In plain truth, more than half the advance of commerce is due to the spirit of speculation—risking a little to gain much—in fact, the gambling spirit. Mr. Rogers says, "What is wanted "is liberty to act; what is offered by the law is a hindrance on "action compensated by a future cession of *that which in ninety-*"*nine cases out of a hundred was as much every one else's right as* "*it was the right of the appropriator.*" This is a strong assertion, but, like other opponents of patents, Mr. Rogers fails to give a single illustration. We want to know what are the trades hampered by patents? what are the inventions which a dozen persons have perfected at the same time? As all the most important inventions are only perfected by degrees, and after continuous labour, in spite of the objections of manufacturers to change their machinery, we want to know what inducement would encourage inventors who were not capitalist manufacturers. In Mr. Bessemer's case, as soon as his process was perfected—if he had been silly enough to waste his time in such an effort—any one could have adopted the results of ten thousand pounds. But, says Mr. Rogers, there are public benefactors amongst men of science who cannot take out patents. He mentions geologists, medical men, agriculturists, and bankers—very unlikely illustrations these. If Mr. Bete Jukes's science told him where an unsuspected coal-mine lay, he could obtain a lease on favourable terms, or a handsome bonus under an ordinary bargain. If Sir Roderick Murchison had been young, poor, and enterprising, instead of old and satisfied, he could have backed his opinions, explored Australia in person, and earned some thousands by his foresight. He is not to be pitied because he preferred to write a few lines of scientific guesses, and stay at home in honour and comfort. A physician who invents a successful practice makes a fortune without a patent. For instance, look at Dr. Chapman and his ice process, who was unknown the other day, and now the trusted and petted attendant of duchesses; and as to banking, did not Gilbert invent the Westminster Joint-Stock Bank, and make a fortune out of it. But these are, after all, sentimental arguments on both sides. The opponents of patents have to prove that they discourage and hamper commercial progress, and until they do this they do not advance a step in their invasion. Professor Rogers seems an excellent specimen of the desk philosopher. He wishes to give every working man a vote—a gift of very doubtful value to the man and the nation—and he wishes to prevent any working man from drawing a prize in the lottery of invention. There are to be no more successors of Watt, Arkwright, Stephenson, Maudslay, Field, Roberts. The patent laws require reform, no doubt; so did and do the land laws, and we need not despair of seeing both simplified. An immense stride has been made in the reprinting of all the old specifications, with a complete index.

Mr. Goodman, at the Birmingham British Association meeting, read a very interesting paper on the small arms manufacture of that town, which would bear reprinting in a more complete shape. The total number of workmen employed is 7340—of these 3420 are engaged in producing the materials, 700 on the barrel; 1200 on the lock; and 500 on the bayonet. Setting up these materials employs 3920. The work is chiefly paid by the piece. During the last ten years, the wages earned have been beyond the average of other Birmingham trades. High skill is required in several departments. A military barrel must receive a plug measuring the 577 thousandth of an inch, and is condemned if it takes one of 580. A workman in this branch in full employment may earn £5 to £6 a week. A workman will frequently employ assistants, paying boys, 5s. to 10s., and adults 15s. to 25s., and thus earn several pounds for himself. A workman is held to be an inferior hand who cannot earn single-handed 30s. a week. America taught England the use of machinery in the manufacture of small arms. The attention of the Government was first called to the importance of using machinery to produce guns on the interchangeable principle, by the report of Messrs. Whitworth and G. Wallis, as commissioners, sent over to the New York International Exhibition. The Enfield Factory was the first result of this report. The Birmingham Small Arms Company has more recently carried out the plan more completely. It is in full working operation, and will be able eventually to produce 1000 guns per week; with 300 machines at work it produces 500 per week. During the late American Civil War in October, 1862, as many as 2000 rifles were proved every day in Birmingham. The total number of Enfield rifles supplied to America between 1862, and September, 1863, was 1,027,336, of which Birmingham sent 682,534, and London 344,802. Without the aid of machinery, Birmingham would lose the higher class of military trade and be beaten by the cheaper labour of the Belgian labourer at Liege. If reports on the condition of all the trades of England (except the cotton trade) were prepared it would be found that the English workman (if healthy) has in his hands a greater means of comfort and independence than any other body of men of the same class in Europe. We do not add America, because it is impossible to obtain correct information in the transition state of that extraordinary country. While there is no doubt of the success of the able hardworking farmer, settled on wild land, who can reclaim and till with the help of his family, mechanics, engineers, and cabinet-makers, have stated that from various causes, they could save more money in London than in New York.

The steady rise in the condition of the British workman is shown indirectly by the reports of the Poor-Law Board. In 1849, pauperism amounted to 6·2 of the population; in 1860, it had been reduced to 4·3; and last year the cotton famine only raised the numbers to 4·9. In 1849 there were 228,823 able-bodied paupers; in 1860 they were reduced to 132,120; and in 1863, the worst year of the cotton famine, only reached 139,120. These figures completely disprove the notion, so popular on the Continent and so frequently referred to in official literary organs of the French Government, of the enormous and increasing pauperism of Great Britain. We have not the least doubt, from extended observation, that there is much more destitution in France than in England. But as the scale of living is much higher here than in France, a family is considered, or considers itself, poor on food and clothes that would be considered ample in France. Pauperism, as long as it does not openly beg, is not a crime in our towns. In France

the want of a visible means of getting a living is a crime suppressed by the police. It is to be hoped that, as far as children, cripples, and the absolutely infirm and aged are concerned, it will soon be treated as a police offence here. But the English workman has over the continental mechanic an immense advantage, if he desires to rise in the world, in two great facilities—the one for saving, the other for obtaining credit. Savings banks swarm, and people willing to advance money and trust goods to an industrious working manufacturer abound. In France the banking system is in its infancy; cheques for small sums are not understood.

The *Revue Contemporaine*, in a recent article on the laws of succession, points to the pauperism of England as the result of the liberty of bequest which every English father enjoys. The whole argument is based on a delusion and a fallacy. In the first place, our pauperism does not exceed the per centage of France, as Lavergne showed in the *Revue des Deux Mondes*, some years ago; and in the next place, the accumulation of wealth in England, as distinguished from forced division of property in France provides every district with a certain number of wealthy persons whose funds are reservoirs of capital constantly supplying streams of wages and of smaller capitals. In France, the prefect or sub-prefect, the chief of the police, the priest, and perhaps a banker, are the only great people in a district as large as Rutland. Pauperism is nourished in England by intemperance, by the ease with which cant obtains ill-deserved charity, by the number of destitute or untaught children of the Arab class. We want—and the *Lancet* is working usefully for it—a complete separation between the sick, the insane, the bedridden, and decrepitly aged, and the lazy pauper. The workhouses in rural districts were built, thirty years ago, absurdly too large. Take Bedfordshire, for instance. Cannot the London parishes, like St. Martin's le Grand, Clerkenwell, &c., who have no room for their sick and their grandmother and grandfather paupers, make economical arrangements with the over-housed rural parishes to become tenants of their deserted barracks. This would be cheaper than building, and afford guardians a fair excuse for annual or quarterly excursions. A school is one thing, an hospital is another; but the establishment for able-bodied paupers at the present price of labour ought to be very like a prison, with door for daily escape.

The speculative world has been lately put into a state of excitement by the promulgation of a scheme for supplying the northern districts of London with water drawn from the Severn, at Tewkesbury, which has been ushered forth under the authority of Mr. Hamilton Fulton. This scheme has the merit of boldness, at any rate; but it raises many reflections of great importance that seem to us to point to fatal objections to it. In the first place, the scheme, as propounded, would in no way whatever serve to compensate for the water that is extracted from the Thames at and above Kingston; for the parts of London that are proposed to be supplied are those that are at present supplied by the West Middlesex, the New River, the East London; of which only the West Middlesex takes its supplies from the Thames at Hampton. Then the fact of leading the waters from the valley of the Severn to the valley of the Thames seems to us a most chimerical notion; and it is one which, in the present temper of the House of Commons, will not be listened to for a moment On several occasions the House has decided that, unless upon great emergency, and when every means of meeting the wants of a population had failed, every distinct hydrographical basin should satisfy the wants of those located in it; and there appear to be reasons for the assertion of this principle. If the inhabitants of the lower valley of the Thames suffer from the abstraction of the water of their river, it would be manifestly unfair to repeat that operation on the lower part of the Severn; but, in this case, the proposers of the measure intend to affect the supply of the river Severn in the upper part of its course, where the mischief would be more sensibly felt; and they would lead the water to the part of the town of London where it would in nowise benefit the river Thames. We wonder what may be the opinions of the inhabitants of Gloucester and all the lower parts of the river with respect to this scheme of abstracting the head waters that now flow past them in their way to the sea? Surely, the wishes or the wants of these people should be consulted in this matter. There are, it is fair to add, the towns of Shrewsbury and Worcester, situated upon the part of the Severn that is above Tewkesbury, and several large villages, such as Colebrook Dale, Bewdley, &c., that pour their sewage into the stream; so that we should think that the arguments that are drawn from the pollution of the Thames at Kingston would apply with equal force to the Severn at Tewkesbury.

Whilst upon this subject, we cannot but express our surprise that such a man as the Duc d'Aumale should have lent the sanction of his name to the project that has been put forth for establishing a lock upon the lower part of the Thames, in the neighbourhood of Brentford. The facts of the case are, that the waters of the Thames are, in this part of its course, more dependent upon the supply of the tidal wave than they are upon the land waters; and everything that would tend to diminish the quantity of the tidal waters would *pro tanto* diminish the scouring power of the river, and thus increase the infection which is said to be occasioned by the pouring of the sewage into the stream. The Duc d'Aumale might have learnt better engineering from the practice of his French friends, who strive to induce the tidal wave to run as far up into the country as they possibly can; at any rate, they would seriously oppose any project that should tend to diminish the scouring action of the river. It is odd that no one seems, in the discussion that took place the other day on this subject, to have noticed the interference with the propagation of the tidal wave that is effected by the various bridges that are now in progress on the Thames, though a great part of the scantiness of water must be attributed to this cause. The coffer-dams or the buildings that are being erected at Cannon Street, Blackfriars, and the Victoria Bridges, must, we should think, be held responsible for much of the diminished flow of the river; and the restoration of the normal flow, upon the demolition of the temporary impediments, will as certainly restore the ancient state of things—perhaps to the great danger of the bridges themselves.

In compliance with the wishes of several correspondents we reprint Mr. Quick's report to the Southwark and Vauxhall Water Company on constant water supply, to which we referred in a recent number. We have taken the trouble, whilst the discussion with respect to Mr. Quick's report is going on, to calculate the populations to which that system has been applied, and we find that, in England alone, the water is delivered on the constant system to about 5 millions of the fixed town population. The assertion of Mr. Quick, therefore, is the more extraordinary, that this system had proved a signal failure wherever it had been applied; and we look in vain for a justification of so sweeping an assertion. It may be that upon the constant delivery there are other, and more stringent, measures required to check the waste; but this must be always the case with any method that should place water constantly at the command of the users of that fluid, and the efforts of the engineers must be directed to the prevention of this abuse. But for Mr. Quick to say that the prevention in question is impossible, is about on a par with the assertion that the constant delivery has proved hitherto a source of failure wherever employed. The public is entitled to better arguments than those that have yet been urged against the constant delivery, and these would, we think, be best sought in the expediency of making a thorough change in the details of the house services.

THE LEAMINGTON LOCAL BOARD AND THE GAS COMPANY.

Most persons like to have something to show for the money they have expended, and the Leamington Local Board of Health having squandered upwards of £700 in opposing the Bill promoted by the Leamington Gas Company, are anxious to make it appear that the alterations made in the Bill at their instigation were worth the money, and may be turned to account in effecting a saving in the public lighting of the town. They accordingly applied to Mr. Hughes—whose success at Reading in showing the minimum quantity of light that may be called street illumination had probably reached them—to assist in recouping the loss incurred in parliamentary expenses by economizing the supply of light. We noticed in our last the leading features of Mr. Hughes's preliminary and probationary report, but as the dispute between the Leamington Gas Company and the Local Board is assuming a form that promises to put to the test the crotchets of Mr. Hughes about public lighting and his "double tap," we reproduce the report *in extenso*, in order to explain the correspondence on the subject which has taken place between the Local Board and the gas company:—

14, *Park Street, Westminster, Aug.* 24, 1865.

Gentlemen,—Having perused the paper forwarded to me by the clerk of your board, in reference to the public lighting in Leamington, I now beg to report that in my opinion a very considerable economy will result from employing meters for the public lamps, in accordance with the provisions contained in section 50 of the Leamington Priors Gas Act, 1865.

I have carefully calculated, from a printed schedule which had been supplied to me, the number of hours burnt by each public lamp, according to the agreement of the 2nd of April, 1861, and assuming that in each case the lamp is to be lighted and extinguished each within one hour, I find the time of burning for each lamp to be 3000 hours per annum. On this basis I calculated, if the gas be supplied by the company at 3s. 6d. per 1000 feet, the rate fixed in the Leamington Gas Act of last session, and the board take the cost of lighting, extinguishing, cleaning, painting, and repairing into their own hands, the cost per lamp for a sufficient light will not exceed £2. 5s. per annum.

I strongly recommend the board to undertake all the services of lighting, cleansing, &c., and to let this work by contract. From my experience of other towns, I am certain that there are many small tradesmen, such as gas-fitters and others, in Leamington, who would willingly contract to perform the work at from 8s. to 10s. per lamp per annum.

My opinion is requested as to the advisability of the board purchasing the present lamp-posts from the company, at a valuation to be made by an arbitrator on either side with power to appoint an umpire in case of difference.

Although I cursorily inspected the public lamps during a professional visit to Leamington in the course of the last parliamentary session, I am not able to remember any very full particulars respecting the lamp-posts; but my impression is that they are old-fashioned heavy castings, and that the lamp-heads are such as to obstruct the passage of a lighting-rod, which I would strongly recommend for use should the local board decide on taking the lighting into their own hands. Bearing in mind also the fact that new lamp-posts of a very substantial kind may now be had complete with lanterns and lamp-heads for 46s. each, or with door to receive meters at 52s. each, I should certainly not recommend the purchase of the present old lamp-columns, unless they can be had at a very low price, such as 3s. 6d. or 4s. per cwt., and even at this low price the cost of alterations to adapt them to meters will make them nearly as expensive as new lamp-posts.

I consider the present regulators fixed to the lamp-posts radically bad, wasteful, and inconsistent with an economical and proper light, and recommend the board to insist on the proper regulating apparatus referred to in clause 50 of the Leamington Gas Act, 1865, for the purpose of securing uniformity of consumption between the metered and unmetered lamps. I shall be happy to submit to the board the apparatus which, on my recommendation, has been adopted at Reading for this purpose, and provided by the gas company, with the consent of the local board, and which has now been working satisfactorily for two years.

A similar regulating apparatus has also been used for several years at Bolton and Worthing, where the public lamps are paid for by the average meter indications.

The system of meters for public lamps is now becoming very general. For instance, they are used in Worthing, Torquay, St. Ives, Blackpool, Bolton, Lincoln, Leicester, Perth, Dunkeld, Salisbury, Reading, Aylesbury, and many other places.

In addition to Leamington, Parliament has recently sanctioned average meter indications for the public lamps in Portsmouth, Birmingham, Nottingham, and many other large towns.

In some of the towns above mentioned, the system has not yielded satisfactory results, owing to constant quarrels with the gas company because no proper means had been adopted, as now insisted on by Parliament, for securing uniformity of consumption between the metered and unmetered lamps; on the other hand, where the double tap has been adopted for this purpose, as at Worthing, Reading, and Bolton, the results have been eminently satisfactory. For instance, at Worthing the consumption by meter does not exceed 3 feet per hour, instead of 5 feet usually charged by the company when they burn by contract.

At Reading, the board formerly paid by contract for 4 feet per hour, but the consumption by meter has been reduced to 2½.

At Bolton, the gas used is cannel gas, varying in illuminating power from 16 to 20 candles.

They had three classes of burners in the public lamps, which, before the introduction of meters, were paid for at the following rates of consumption:

No. 1 burner, consuming 1⅝ feet per hour.
„ 2 „ „ 2½ „
„ 3 „ „ 3½ „

Since the introduction of meters in 1862-3, the No. 1 burners have consumed 1·18 feet per hour, making a saving of 29 per cent.; the No. 2 burners have consumed 1·93 per hour, making a saving of 23 per cent.; and the No. 3 burners have consumed just over 2 feet per hour, making a saving of 42 per cent. As the greater proportion of the burners are of this No. 1 class, the average saving in all the burners has been 28 per cent., which is also the actual money saving in the amount paid for gas, notwithstanding the small consumption which prevailed before the meters were introduced.

The case of Reading, where the quality is 12-candle gas, is more analogous to Leamington, and there the meters have reduced the gas to be paid for from 4 feet to 2½ feet per hour.

Should the board decide to carry into effect the arrangements for burning by meter in a satisfactory manner, there are many precautions which must be taken to produce uniformity between the metered and unmetered lamps, and to create, as far as possible, an amicable feeling; or, at all events, not to promote an hostile feeling on the part of the gas company.

The subject of burners, and a proper regulating apparatus, will have to be settled with the company under the provisions of the Act, and I am prepared with the specimens of those which have been adopted in other towns, and proposed for adoption here. Such is the difference in the ordinary bat's-wing burners used by the public lamps, that I have in my possession burners, taken from the lamp-posts of large towns, which do not give half the light produced by the same quantity of the same gas when consumed in a proper manner. The selection of burners and a proper regulating apparatus is therefore very important, and not less so is the proper pressure at which the taps are to be set, and for which the burners are to be calculated.

If it meets the pleasure of the board to appoint me for this purpose, I will endeavour to arrange these various points with the engineer or manager of the gas company, as contemplated in the 50th section of the Act.

I am, gentlemen, your very obedient servant,

SAMUEL HUGHES.

Besides this, "a private letter" was sent to the clerk by Mr. Hughes, in which he stated that he would undertake the supervision of the carrying out of these suggestions during the space of twelve months for £100, or for £5. 5s. and expenses a day for the time in which he was so employed. In addition to this there should be a person on the spot, whose time would be partially employed under him to watch the registers, adjust the taps of the lamp-posts, and read the meters. His cost would be a third part, or 30s. or 40s. per week. He also suggested that the board should have their own pressure-gauge to record on a sheet of paper the pressure of the gas. This would cost, with clockwork complete, something less than £10. They ought also to have a small gasholder, for testing the capacity of burners, which would cost £10 or £12. He also recommended the purchase of about 60 meters.

Local Board of Health, Leamington, Aug. 25, 1865.

Dear Sir,—The board have adopted your report, and have directed me to secure your services to superintend the same upon the terms of your letter—namely, the payment of £100 for the twelve months superintendence, without any extras for personal travelling or other expenses. I presume it will be necessary for you to visit Leamington shortly to have a meeting with the gas company. Please give me a few days notice of this, as I may require to have a meeting of the board to receive any further suggestions you may have to make. You are aware that our present contract expires on the 29th of September; no time should therefore be lost.—Yours, &c., R. A. WALLINGTON.

Samuel Hughes, Esq., 14, Park Street, Westminster.

14, *Park Street, Westminster, Aug.* 28, 1865.

Dear Sir,—I propose being at Leamington early on Friday morning, and will attend any meeting you may arrange either on that day or Saturday with the gas company or their representative. I can either attend the board before or after this meeting as you think proper to arrange. If you wish me on Wednesday, please address Chase Bank, Southgate.—Dear Sir, yours, &c., S. HUGHES.

In the foregoing report it will be observed that Mr. Hughes twice alludes to the importance of effecting the proposed arrangements in such a manner as not to occasion a hostile feeling in the gas company. It might thence be assumed, therefore, that having found from experience that quarrels between Local Boards and gas companies had the effect of preventing the attainment of satisfactory results with the average meter system, he was inclined, contrary to his practice heretofore, to use the means of conciliation; but the other parts of the report show that it was far from his intention to do any such thing. His assertions that the present regulators are radically bad; that nothing but the adoption of the double tap could satisfy him; that unless the company consented to sell their lamp-posts at the rate of 3s. 6d. or 4s. per cwt., he should not recommend their purchase; and his strong recommendation to take the lighting and extinguishing out of the hands of the company, were not the kind of "precautions" which would be usually adopted "to create as "far as possible an amicable feeling" in the gas company; and Mr. Hughes must have a strange notion of the tendency of such demonstrations, if he thought they could be considered otherwise than hostile. Though professing peace, he blows the blast of war; and having been so long accustomed to dissension, it seems to have become his natural element. His offers of peace appear, indeed, merely to signify that if the gas company will allow him to do as he pleases, he will be on amicable terms. The report was published in the local papers, and when the gas company were afterwards officially informed that the arrangement of the matters connected with the public lighting had been placed in the hands of Mr. Hughes, they determined to take their stand on their Act, and not to allow themselves to be entrapped into any negotiation with him on those points that had been settled by Parliament. The official notification by the Local Board to the gas company and the reply of the chairman were as follow:—

Local Board of Health, Leamington, Aug. 30.

Gentlemen,—I have to inform you that the Board of Health have placed the question of lighting the public lamps in the hands of Mr. Hughes, civil engineer, of London. I have a letter from Mr. Hughes this morning, wishing me to appoint a meeting with you for Friday morning. There is some doubt as regards the construction of the Act of Parliament with reference to the columns; but if other matters are satisfactorily arranged, I do not think that any difficulty need arise upon this point, as the board will find their own columns. You are doubtless aware that the gas company are bound to provide the lanterns; but this Mr. Hughes will discuss with you. I shall be glad to know as early to-day as you can whether it will be convenient to you to see Mr. Hughes on Friday, as I wish to write to him to-night.—Yours, &c., R. A. WALLINGTON.

Messrs. Robinson, Gas-Works, Leamington.

Royal Leamington Spa Gas-Works, Aug. 30, 1865.

Sir,—We have to acknowledge the receipt of your letter of this morning. The matter it refers to is an important one, and we do not feel at liberty to deal with it without instruction from the directors of the gas company. Under these circumstances, we cannot of course make any appointment. We will, however, communicate with the committee on the subject.—We are, &c., ROBINSON BROTHERS.

R. A. Wallington, Esq., Leamington.

London, Aug. 31, 1865.

Dear Sir,—In reply to the letter you addressed to Messrs. Robinson on the 30th inst., I beg to state that, as the company's Act prescribes the conditions on which they are bound to furnish a supply of gas to the public lamps, they see no necessity for their entering into any communication with Mr. Hughes on the subject; but if the Board of Health will inform the company what quantity of gas they require to be supplied to each lamp, and, also, whether it is their intention to provide lamps, service-pipes, burners, and stop-cocks, or to rent or purchase those belonging to the

company, or to light, extinguish, clean and repair the lamps, the company will at once state the terms on which they are willing to supply the public lamps with gas, and upon the acceptance by the Local Board of Health, the company will take the necessary measures for carrying out the board's wishes in the matter. I beg to add that the company are willing to sell to the board the pillars and lamps, with the services, pipes, burners, stop-cocks, and other apparatus attached thereto, at a reasonable price, or on such terms as may be settled by arbitration.—I am, &c.,

JNO. MAUGHAN,
Chairman of the Board of Directors.

R. A. Wallington, Esq., Clerk to the Local Board, Leamington.

Before the adoption of that course of proceeding, the company had, we believe, satisfied themselves by inquiries made at Reading that the double tap failed to produce uniformity between the metered and the unmetered lamps; that even between the metered lamps the registered consumption of gas varied in December last from 2·28 feet to 4·62 per hour; that the gauge-taps were frequently tampered with, requiring to be adjusted once a month; that the indicated average consumption per light per hour was not 2½ feet, as stated in Mr. Hughes's report, but 3¼ feet; and that the company were paid for only a portion of the gas consumed by the unmetered lamps.

The next portion of the published correspondence exhibits an attempt by the Local Board and their engineer to overreach the gas company in a manner that is utterly unworthy a public body. The 47th section of the Leamington Gas Act requires that "subject to the provisions of this Act, the company shall, at their own expense,"—"provide, lay down, fix, maintain, and keep in repair all such mains and service-pipes, lamps, burners, stop-cocks, and other apparatus connected therewith, as may be necessary for the proper lighting of the highways, streets," &c. No mention is made in that section of rent or compensation to be paid for the use of the service-pipes, lamps, burners, and stop-cocks, and the Local Board therefore contend that those things are to be supplied free of charge. From the 49th section of the Act, however, it is evident that compensation was intended to be made to the company for their use. That section provides that "the company shall, if required by the lighting authority, from time to time light, clean, and extinguish all public lamps to which the company shall supply gas, and the sum to be paid to the company for *such lighting, cleaning, and extinguishing, and for the use, maintenance, and repair of the said lamps, service-pipes, burners, and stop-cocks*, to be provided and maintained by the company as aforesaid, shall, unless otherwise agreed, be thirteen shillings per lamp per annum, payable quarterly."

The sum named is expressly stated to include payment for two distinct things—the first being payment for the labour employed in cleaning, lighting, and extinguishing the lamps; and the second being compensation for the use and maintenance of the gas-burning apparatus. According, however, to the interpretation which Mr. Hughes and the Local Board wish to put on the Act, by taking from the gas company the control over the labour they thereby become possessed of full right to the free use of the apparatus on which the labour is employed. The company are required not only to supply gas to the public lamps at a lower price than to private consumers, but they are required to provide, without any charge, the means of burning it to the satisfaction of the Local Board; and though without any control over the men employed, they are expected to be responsible for any damage they may commit. Such an attempt to strain the law to their own purposes does not tell favourably for the notions of justice entertained by the Local Board and their new engineer, and can scarcely be commended as one of the "precautions" he recommended to be taken to create an amicable feeling in the gas company. This part of the question in dispute is set forth prominently in the following "Remarks by Mr. Hughes," and the subsequent correspondence:—

Board of Health, Leamington, Sept. 5, 1865.

Dear Sir,—Your favour of the 31st ult. was read at the meeting of the board this day, and I am directed to reply thereto.

It is true that the company's Act prescribes the price at which the gas is to be supplied, but, as far as I read the Act, that is the only question that is settled. As regards the lanterns, service-pipes, and burners, the company have to supply them. The only question is as regards the columns. This the board have referred to Mr. Hughes, and if the company decline to have any communication with him, the only alternative will be for the board to supply their own columns.

The board cannot be advised to leave anything to arbitration.

I enclose you a copy of Mr. Hughes's report to the board, and have to request that you will supply the information respecting the regulating apparatus and burners, which are to be provided by the company to the satisfaction of the board.

Mr. Hughes's notes appear to me to be so full, that it is hardly necessary that I should add anything to them.

I may add, however, that the question of purchasing the columns is left entirely to Mr. Hughes. The question of burning by meter has already been decided by the board.—I am, &c.,

R. A. WALLINGTON,
Clerk to the Board.

John Maughan, Esq., Chairman of the Leamington Gas Company.

Remarks by Mr. Hughes on the Letter of Aug. 31, 1865, addressed by Mr. Maughan, of the Leamington Gas Company, to the Clerk of the Local Board.

Mr. Maughan observes that "as the company's Act prescribes the conditions which they are bound to furnish a supply of gas to the public lamps, they see no necessity for their entering into any communication with Mr. Hughes on the subject." On the contrary, it is these very conditions so prescribed in the Act which render a conference necessary. At their meeting on the 25th of August last, the board decided to take the lighting, extinguishing, etc., into their own hands, and that the gas for the public lamps be consumed by meter, and it will be found that clause 50 of the Act prescribes the conditions under which the gas shall be consumed in the event of the board so deciding. Under this clause the *meters* are to be provided by the board, but the *regulating apparatus* and *burners* are to be provided by the company to the satisfaction of the board. One important object of the conference proposed in the clerk's letter of the 30th of August was, to ascertain the description of regulating apparatus and what kind of burners the company propose to provide. Many arrangements have to be made before the 29th of September, on which the present contract expires, and it is obvious that the responsibility and inconvenience which result from declining the proposed conference must rest entirely with the gas company.

Mr. Maughan offers to state the terms on which the company will be willing to supply the public lamps provided the local board will furnish certain information as to the quantity of gas required. There seems to be, however, no necessity to state these terms, unless they propose to supply at a lower rate than 3s. 6d. per 1000 feet, which is the *maximum* fixed in clause 55 of the Act for gas consumed by meter in the public lamps. The question as to the board supplying the *lamps, service-pipes, burners*, and *stop-cocks*, is partly answered in a letter addressed by the clerk to Messrs. Robinson on the 30th of August. In that letter it is stated that the board will provide their own *columns*. As to the *lamps, service-pipes, burners*, and *stop-cocks*, the Act directs expressly that these shall be provided by the company. Under these circumstances, it seems that the chief point requiring immediate discussion with the company refers to the *regulating apparatus* and *burners*, which the company are to provide to the satisfaction of the board, and therefore it is again requested either that a conference may be appointed or that specimens of the *apparatus* and burners may be submitted without delay for the consideration of the board.

(This was unsigned by Mr. Hughes.)

14, *Park Street, Westminster, Sept. 4, 1865.*

Dear Sir,—I presume that in the course of a few days you will obtain from the gas company specimens of the regulating apparatus and burners which they propose to provide for the public lamps. In the meantime I think that one or more self-registering pressure-gauges should be at once put up, in order that we may have as early as possible a correct record of the pressures at which the gas is supplied by the company. Perhaps you will kindly bring this subject before the meeting to-morrow, and let me know if I shall order the gauges to be sent down at once, as they will probably require some days to prepare. I propose to send you a few elevations of lamp-posts, with and without meters, also, probable prices; and then, if the board will decide on the design, I will prepare working drawings and specifications, so as to enable the iron-founders to tender for them.

I am, dear sir, yours truly,
S. HUGHES.

R. A. Wallington, Esq., Clerk to the Local Board, Leamington.

A meeting of the Local Board was held on the 5th inst,. at which the correspondence up to that date was read, and it appears from the report of the proceedings given in a local journal that there are some members, at least, of the Board who do not approve of the reckless course which the majority are pursuing. Mr. Gascoyne seems to be much less confident than his colleagues in the ultimate success of the labours of Mr. Hughes in the lighting of the town with due regard to its proper illumination; and, alluding to some recent experience, and which should serve as a warning for the future, he remarked that "as the Board had been deceived and disgusted with one stranger, they might be with another." An individual with the euphonious patronymic of Muddeman, who appears to be an active, if not a clear-headed, member of the Board, referred to some experiments made to ascertain the present consumption of gas in the Leamington public lamps, the results of which tended to show that the consumption was irregular, and that the same lamp consumed 20 feet of gas one night, and 60 feet another night. These results are, however, not to be relied on, in consequence of most of the experiments having been made with meters not adapted to indicate small quantities of gas passed through them. The facts we believe to be as follow:—The indices of two only out of the six meters used in the experiments could be read off to single cubic feet, and those two meters indicated almost exact equality of consumption. The other instruments employed were ordinary 2-light consumers meters, and the readings of all the indications between 100 feet were guessed at from the position of the pointer; which it is well known is liable to deceive an observer when the tooth of one of the wheels is just catching the tooth of another wheel; and such a source of error may occasion a variation in the indication of 30 or 40 feet. Nightly experiments with such meters are therefore worthless, and though it may answer Mr. Muddeman's purpose to quote the results, no practical person will be misled by them.

We now come to the most important part of the dispute be-

tween the Local Board and the gas company, so far as it has yet proceeded. The company's Act requires, as a condition of the supply of gas by partial meter indication, that every lamp shall be furnished by the company "with a proper self-acting "pressure-regulator, or other proper regulating apparatus and "burners, to the satisfaction of the lighting authority." Mr. Hughes, however, in his report of August 24, boldly condemned the self-acting pressure regulators now in use, and had the assurance to assert that his "double tap" is the proper regulating apparatus referred to in clause 50 of the Leamington Gas Act. The gas company, on the other hand, maintain that the double tap is no "proper regulating apparatus" at all, and will not consent to such an instrument being used, without first obtaining the judgment of the chairman of the Court of Quarter Sessions, to whom all differences on the subject of regulators and burners are, according to the Act, to be referred. The Local Board did not wish to face the Quarter Sessions, and, to avoid the adjustment of the dispute in that manner, they altered their tactics, and, throwing overboard the double tap as a regulating apparatus, they sought to introduce it as an *additional stop-cock*—the clerk of the Board having the recklessness to assert, in the following letter, that they have clearly the right to fix any additional stop-cocks they choose, and that it is a matter over which the chairman of the Quarter Sessions has no jurisdiction.

7, Lancaster Terrace, Regent's Park, N.W., Sept. 7, 1865.

Dear Sir,—I beg to acknowledge the receipt of your letter of the 5th instant, and regret that any difference of opinion should exist between us as to the construction to be placed on the company's Act with reference to the supply of gas to the public lamps.

Your letter to Mr. Hanbury, of the 30th ult., informed us that the board had decided to burn by meter, and would provide their own columns, to which course we have no objection, although we doubt whether the local board are best promoting the public interests by incurring an expenditure of from £1500 to £2000 in providing new columns and throwing on the company's hands those already in use; because that loss, like other needless expenses to which the company has been subjected, must ultimately fall on the gas consumers, and retard reductions in the price of gas.

It is true the company are bound to provide the service-pipes, lamps, burners, and stop-cocks; but as the board propose to take the lighting, cleansing, and extinguishing into their own hands, it is necessary that the rent or compensation to be paid for the use, maintenance, and repair of such service-pipes, lamps, burners, and stop-cocks should be previously settled; and we consider that 4s. 6d. per lamp would be only a reasonable compensation for such services. We propose to continue the use of the self-acting regulating apparatus now fitted to the lamps, adjusting them to the consumption per hour which the board may direct. We object to the use of the double tap referred to in Mr. Hughes's report to the board of the 24th ult., as not being a proper regulating apparatus within the meaning of the Act; and in case of any difference between us on that point, we are prepared to refer it to the Chairman of Quarter Sessions, as provided by the 50th section.—I am, &c,

JOHN MAUGHAN.

Local Board of Health, Leamington, Sept. 9, 1865.

Dear Sir,—The committee of the whole board have met to-day, and have had under their consideration your reply to me of the 7th instant, which was simultaneously published in the *Leamington Spa Courier* of this date.

I am directed to enclose you copies of the resolutions passed by the committee, which you will find on fly-leaf.

I am further directed to add that the board have not refused to purchase the columns, but, on the contrary, they have referred the whole subject to Mr. Hughes to settle on their behalf; and it is your refusal alone to meet Mr. Hughes which compels the board to procure fresh columns. I must observe, however, that your letter and one received from Mr. Hanbury (clerk to the gas company), dated July 26, 1865, do not agree.

Mr. Hanbury states as follows:—"The directors of the gas company beg the favour of a distinct answer to this inquiry in the course of next week, as they wish to avail themselves of opportunities of disposing of their columns, in the event of the local board declining to purchase on the terms suggested."

This does not imply that the company would sustain any loss in case the board did not purchase; but this is a question which the board cannot entertain, as they have simply the public interests to consider.

I again, however, suggest that the company should, either by themselves or their agent, have an interview with Mr. Hughes, who has full powers to act on behalf of the board.

By the company's Act they are bound to provide service-pipes, lamps, burners, and stop-cocks free of charge to the board; and if the board choose to fix any additional stop-cocks, they clearly have a right to do so; and it is a matter over which the Chairman of the Court of Quarter Sessions has no jurisdiction. This is a matter of detail which Mr. Hughes can settle with you. I may say, however, that the "double tap" will be provided at the expense of the board, and for their own protection.

I trust that I may receive a letter from you stating that the company are willing to meet Mr. Hughes and discuss the question with him, as it appears to me this will be the only mode of settling any differences which may arise.—I am, &c., R. A. WALLINGTON, Clerk to the Board.

John Maughan, Esq., Chairman of the Leamington Gas Company.

[Copy Resolutions—passed unanimously.]

1. "The board are sorry to find the gas company decline to meet Mr. Hughes to negotiate with them as to lighting the public lamps by meter; and as they decline to treat with him as to the purchase of the company's columns, the board have decided to advertise for tenders from persons willing to deliver 600 columns at Leamington, and that the clerk be instructed to embody the above in a letter to the chairman of the gas company."

2. "That Mr. Hughes be requested to prepare a specification for lamp column No 2, and that advertisements be inserted forthwith inviting tenders for 600 of the same delivered at Leamington."

London, Sept. 11, 1865.

Dear Sir,—I beg to acknowledge the receipt of your letter of the 9th inst., with a copy of the resolutions passed by the committee of the local board at a meeting held on that day.

The board's reply to Mr. Hanbury's letter of July 26th was, that they would provide their own columns; and, under such circumstances, the gas company did not think it expedient to enter into any negotiations for the sale of the existing ones to the local board. If you are still willing to purchase them, the gas company will entertain any offer you, or Mr Hughes acting on behalf of the board, may make *in writing* with that object.

If, however, the board persist in their resolution to provide new columns, the company will require that the whole of them be made capable of having meters attached, and will pay the extra cost which may be incurred in having eleven out of every twelve columns cast for the reception of meters as provided for by the 50th section of the company's Act.

You appear to be under a misapprehension as to the company not being entitled to make any charge for the use, maintenance, and repair of the lamps, service-pipes, burners, and stop-cocks, as it is expressly provided for by the 49th section of the Act; and the sum named in my letter of the 7th inst., is, I submit, a reasonable compensation for such services. I may also remind you that all the regulating apparatus has to be provided by the company, and that, as the "double tap" is clearly not a proper regulating apparatus, the company will not consent to such an instrument being used without first obtaining a judgment under the 50th section of the Act.—I am, &c., JOHN MAUGHAN, Chairman.

To R. A. Wallington, Esq., Clerk to the Leamington Local Board of Health.

The clerk of Local Board looks so closely to the interests of his employers that he cannot see any part of the Act that does not appear to support their views, and he has consequently been blind to the 51st section, which seems to have been passed specially to meet such a contingency as has now arisen. By that section it is provided that, "The gas supplied "to any such public lamp *shall be permitted to pass unrestrictedly* "*to and from such regulating apparatus* for the whole of the "period during which such public lamp shall be lighted." The legal adviser of the Leamington Local Board will find some difficulty in wriggling out of such a stringent provision, and he must, we conceive, be bound to admit that the Local Board cannot do exactly as they choose with the gas company, even in such a matter as fixing the "double tap" as an additional stop-cock to the regulating apparatus.

The negotiations between the Leamington Local Board and the gas company seem thus, with the able assistance of Mr. Hughes, to have come to a dead lock. The existing contract for lighting the town expires on the 29th inst., and the inhabitants have the prospect of being involved in darkness during the coming winter nights, while the engineer, whose remarkable precautions not to create a hostile feeling have produced this state of things, may repose in London, with the satisfaction of thinking that he is earning his £100 without much labour. Blame cannot be thrown on the gas company. They have shown a disposition to meet the Board on all points except the surrender of the key of their property, which the adoption of the "double tap" involves. They have stated their willingness to sell, or to let their lamp-columns on hire, and have invited proposals from the Board. The lighting authority have no power to depute any person to negotiate on their behalf, and the gas company could not reasonably be expected to enter into personal negotiations with a deputy who preluded his advent to the town with a declaration of war. To be prepared against any adverse contingency, the gas company have given notice to the Board that they require all the proposed new lamp-columns to be adapted to receive meters, offering to pay the additional cost, which Mr. Hughes, in his report, estimates at 6s. per column. Their intention, no doubt, is to fix a meter to every lamp should the decision of the chairman of Quarter Sessions, if appealed to, be favourable to the double tap as a regulating apparatus. The company have so much right on their side, that we trust they will make a determined stand against the attempted exactions of the Local Board, who must, in that case, ultimately give way, as the authorities of Birmingham and Nottingham have done on the same questions.

Circular to Gas Companies.

HE is a wise man who can learn from the experience of others, for the lessons of experience are generally very dearly bought, and some teaching of that kind of a more than ordinarily costly character has come to our knowledge which those who run may read, if so inclined. We hear, on good authority, that the charges of the engineer and surveyor of one of the mushroom consumers gas companies, got up towards the end of last year, and brought before Parliament, amount to nearly, if not quite, £1900! The Bill was not passed, but that was of little moment to the concoctors of the scheme if they can obtain payment for

their services at such a rate. We shall in due time lay before our readers the particulars of the extortionate demands, which we understand it is the intention of those who are called on to pay the amount to resist. They are, however, only examples in an exaggerated form of the usual results from the getting up of similar companies. The object of the projectors in such cases is generally limited to the levying of contributions on the deluded shareholders, who vainly expect to obtain cheap gas and ample dividends, but who most frequently not only lose their money, but have to pay an increased price for gas, owing to the parliamentary expenses entailed on the existing gas company in defending their position. Some years since, the civic paraphernalia and the market tolls of Wolverhampton were seized for the payment of an engineer's account, in default of other available assets; and though the fact was well known at the time, it produced but little effect as a warning in other places, and year after year we perceive like attempts successfully made on the credulity and the pockets of gas consumers. We shall not cease, nevertheless, to repeat such warnings from time to time, especially when so gross a case of extortion as the one in question comes to our notice. No system of raising money could well be more iniquitous than that of exciting discontent for the purpose of obtaining a pretext for forming a company for no other object than to put money into the pockets of the promoters. It may seem strange that gas consumers become so readily victims to such schemes, but the cause is, we believe, to be found in the dislike generally entertained to monopoly. The duty and the interest of gas companies under such circumstances is, to disarm hostility by frank, courteous, and liberal conduct to their customers and the public. By making it clearly appear that their affairs are well managed, that their profits on the capital invested are only reasonably remunerative, that they are anxious to lower the price of gas as soon as the state of their finances will permit, and by exercising the monopoly of supply with courtesy and forbearance, all gas companies might become popular, instead of being, as we fear is too frequently the case, regarded with dislike and suspicion, and as legitimate objects of attack from any quarter.

It is always with great satisfaction that we announce reductions in the price of gas, especially when they are the consequence of the legitimate operation of the Gas-Works Clauses Act, put in action by gas companies themselves. Such a reduction has been recently made by the South Metropolitan Gas Company, who have lowered the price in their home district from 3s. 8d., to 3s. 6d. per 1000 feet; and the Crystal Palace District Gas Company have reduced their price to 4s. 7d. In neither of these cases was there any external pressure on the companies; the only compulsion having been an excess of profits after paying the prescribed dividend allowed by the Act.

A new edition of the pocket Treatise on Gas-Works, by Mr. S. Hughes, which forms one of Weale's Rudimentary Series, has just been published.* This edition has been revised by Mr. W. Richards, who is favourably known to the public as the inventor of the dry gas-meter in its present form. He was for several years manager of the gas-works at Barcelona, during which period he designed and erected gas-works in several adjacent cities and towns, and he has, therefore, such a practical knowledge of the subject as well qualifies him to revise a treatise of this kind. In the preface Mr. Richards explains that the engagements of Mr. Hughes prevented him from making the necessary revisions for a new edition, and that he has consequently been entrusted with the task. He has executed it in an able manner, very independent of the original. In the introductory chapters on the early history of gas lighting, indeed, there seems to be little change, and there is none whatever in the last one, treating of the parochial assessment of gas-works—which might, with advantage, have been omitted altogether, as inconsistent with the general object of the treatise—but all the other portions have been almost entirely rewritten. There are 22 chapters, for which Mr. Richards may be considered as mainly, if not altogether, responsible, and in those he treats of the chemistry of gas lighting, of coal and its carbonization, of appropriate sites for gas-works, of retort-houses and the settings of retorts, of the hydraulic main, the purification of gas, of gasholders, exhausters, and meters, of the laying of mains, and the indication of pressure, the governor and regulator, of experiments with coal gas, of burners, residual products, and water gas. It will be seen, therefore, that the whole subject of making and distributing gas has been noticed, but it must be observed that this has been done with a very abstemious recourse to illustration. In the process of reconstruction the matter has been condensed into 32 pages less than the original treatise. It might be expected that in a book on gas making and gas apparatus, with the name of Mr. Hughes on the title page, the "double tap" would have been made prominent as surpassing all other regulating instruments; but, strangely enough, Mr. Richards has omitted all mention of it. Less than a page is devoted to regulators of any kind, and among them does not appear "the proper regulating apparatus" of the double tap, which Mr. Hughes says was specially intended by Parliament to be introduced in street-lamps. We may say, in conclusion, that this manual on gas lighting, without any pretension to be a standard work, contains much elementary information in an accessible form to those who are unable to purchase larger and more expensive works on the subject.

* *A Treatise on Gas-Works, and the Practice of Manufacturing and Distributing Coal Gas.* By SAMUEL HUGHES, C.E. Second edition, revised by W. RICHARDS, C.E. London: Virtue Brothers and Co., 1, Amen Corner, Paternoster Row.

Register of New Patents.

2832.—GEORGE EDWARD NOONE, of 50, George Street, Hastings, in the co. of Sussex, C.E., for "*Improvements in machinery for deodorizing and utilizing the sewage of towns, and in the treatment of other refuse to be combined therewith, both liquid and solid, for manure and chemical use.*" Patent dated Nov. 14, 1864.

This invention has for its object the deodorizing of sewage and other refuse, both liquid and solid, by heat and cohobation, whereby the produce is rendered applicable for manure and chemical use. By the employment of an air-tight tank, divided into compartments for the purpose of separating the solid and liquid portions, the sewage is received from the mouth of the sewer, and, by means of pumps, is conveyed into boilers with suitable furnaces. The boilers have dome tops like a still-head, and the alkaline vapours and nitrogenous gases evolved are conveyed by pipes into cooling vats and condensing vessels. The liquid, partially deprived of these vapours and gases, flows from the last boiler through a pipe with a double outlet. By a series of mechanical arrangements, the liquid sewage is raised to the required height for irrigating purposes, and retained in covered tanks or stored in barrels for use. In the tank in which the liquid sewage is divided from the solid a chain wheel is fitted, communicating with a second chain wheel on the top of the machine by an endless chain in an inclined position. On this chain, buckets, with holes to drain the liquid, are fixed at equal distances, and the upper chain wheel is driven by machinery, which also works the pumps. The solid sewage is thus drawn up in the buckets, which discharge their contents into a heated chamber, containing several compartments one above the other, each furnished with an endless chain, with plates or racks working over two drums mounted on horizontal axes, and receiving motion from the gearing before mentioned. The solid sewage is carried by the plates the length of the hot bottom of the upper chamber. It then falls to the chamber next below, and is carried in like manner in the opposite direction to the end of the chamber. In thus traversing the chambers, it becomes dry, or nearly so. It is then allowed to fall into a receiver below, to be removed at pleasure. The vapours and gases evolved in the heated chambers pass through pipes attached to the top of the upper chamber, to be cooled and condensed in the manner before described.

2836.—ROBERT HARLOW and WILLIAM JOLLEY, of Heaton Norris, near Manchester, in the co. of Lancaster, for "*Improvements in cocks and valves.*" Patent dated Nov. 14, 1864.

This invention relates, first, to cocks employed for opening and closing the passage of steam, gases, and fluids, and consists in improved arrangements for tightening the plugs without stuffing-boxes or nuts and washers, and for giving a large area of passage with a comparatively small diameter of plug. In one arrangement the barrel is placed in a casing, and held by a nut at one end, and forms around the barrel, between the two ends, a cavity in the casing communicating with the opening or openings of supply or discharge, which cavity is for the purpose of enabling two or more thoroughfares to be made in the plug when there is only one junction, or when there are several; and, as the barrel is simply held in the casing, the expansion, when the casing and the barrel are of different metals, has no prejudicial effect on the working parts. At one end of the plug there is a shaped end for enabling it to be turned, and through the plug a spindle is passed, having one end pointed or flat, and the other end screwed, the extreme end being shaped for the purpose of turning it, and a nut employed for keeping it tight. At one end of the barrel there is a bridge or support for the pointed or flat end of the spindle to work upon, so that, when the spindle is turned in a screwed hole, it shall draw the plug to the barrel to any required tightness, and at the same time enable the plug to be turned with much less friction than with the present modes of tightening.

The invention relates, secondly, to that description of equilibrium valve made with two pistons, having a number of V-slits or other openings, and working in two seatings, which is converted into a reducing or diminishing valve by placing on the spindle an additional piston, working in a cylinder, and connecting the top of the spindle to a weighted lever, so that, as the weight is shifted, the valve may be more or less closed, and diminished accordingly, which arrangements may be applied to all equilibrium valves of a similar nature.

2845.—GEORGE ROBINSON, of Dial Iron-Works, Kingswinford, in the co. of Stafford, manufacturer, for "*Improvements in moulds for casting pipes, columns, and other articles.*" Provisional protection only obtained. Dated Nov. 15, 1864.

According to this invention the mould is constructed in two parts or

halves, but instead of both halves of the mould being made of sand, according to the ordinary practice, the lower half is made of iron, or of steel, and the upper half of sand in the ordinary manner. The lower half of the mould, which is made of iron or steel, is made in preference by casting, but the lower half of the mould may be made by any of the processes by which iron and steel are shaped. By making the lower half of the mould of iron or steel, the process of casting is much facilitated, especially where large numbers of articles are to be cast, as the inversion of the lower mould-box, necessary in the ordinary method of constructing moulds, is avoided. In order to reduce still further the labour of lifting and inverting the upper moulding-box, the upper moulding-box may be hinged to the lower iron or steel half of the mould.

2846.—JEAN JOSEPH MOULIÉ, of Paris, France, manufacturing chemist, for "*Improvements in treating benzole or its principal composing hydrocarbons, such as benzine, toluene, or xylène; applicable also to the treatment of other hydrocarbons.*" Provisional protection only obtained. Dated Nov. 15, 1864.

Hitherto for combining on a manufacturing scale the said hydrocarbons with nitric acid, in order to obtain nitro-benzine, nitro-toluene, and nitro-xylène, the nitric acid and hydrocarbon (whether benzole, benzine, toluene, or xylène) were brought together whilst in the cold state. This invention consists in combining them, whilst in the heated state, with either the acid or the hydrocarbon, or both, being heated to the required degree, and the process taking place either at the ordinary atmospheric pressure, or under an increased pressure, as in a closed vessel.

2883.—ALEXANDER ANGUS CROLL, of Coleman Street, in the City of London, engineer, for "*Improvements in the preparation of materials to be used in the purification of gas for illumination.*" Patent dated Nov. 18, 1864.

These improvements relate to the employment of chloride or sulphate of zinc, or chloride or sulphate of manganese, or chloride or sulphate of iron and lime, combined with sawdust or other porous matter adapted to hold such mixture open and admit of the free action thereon of gas in the purification of such gas for the purpose of illumination.

In carrying out these improvements, when employing sulphate of zinc, such salt of zinc is mixed with lime, by preference, in the state of quick lime or unslaked flare burnt chalk lime in a powdered or finely divided state and in the proportion of five parts or thereabouts of the crystallized salt to one part or thereabouts of the lime. These matters are incorporated by being spread in alternate layers, and then when the lime is slaked thoroughly mixing them up with a free access of air. The composition obtained is then mixed with wood sawdust, or other porous material adapted to hold it open, and admit of the gas freely acting thereon. The mixture so obtained is then placed in the purifying apparatus, through which the gas to be purified is caused to pass—as is well understood when using other matters in the purification of gas for illumination—by which such gas will become purified from sulphuretted hydrogen, ammonia, and other impurities.

When, from use, these purifying materials have become spent, so as to cease to remove sulphuretted hydrogen from the gas passed through them, they may be revivified by the free exposure of them to the atmosphere, when they may be again applied to the purification of gas as before.

It will frequently be found that these purifying matters will, by use, lose their power of removing sulphide of ammonium (a condition which is easily ascertained by their power of blackening a piece of paper immersed in them which has previously been moistened with sulphate of iron), although they may be still capable of acting upon carbonate of ammonia. In this case, a portion of the metallic salt used in the preparation in a strong solution, or in the state of crystallization, is sprinkled over the matters during the revivifying, and such application is continued until carbonate of ammonia ceases to be capable of being readily removed, a condition which may be ascertained by the action of the matters on turmeric paper.

A like treatment will be found applicable to the sulphate of iron or to the sulphate or chloride of manganese, but with the latter salt only one-half of the quantity of lime may be sufficient.

In using the chloride of iron or zinc, the solutions of them are taken, which contain about equal weights (as readily ascertained by ordinary analysis) of anhydrous chlorides and water, and there is added thereto about one-fifth of their weight of the lime, and when the solution contains more water the proportion of lime is reduced. The solution is then dried to a convenient state for use.

In the case of the use of the chlorides in the preparations, care must be taken to avoid a too free exposure to atmospheric influence, on account of their deliquescent tendency, by which a too moist condition might be obtained, which would interfere with the free action of the gas through the preparations. All these preparations, however, vary materially with the amount of the impurities contained in the gas to be purified.

In carrying out these improvements it is found that the best results are obtained by passing the gas first though a preparation obtained by the use of the sulphate of zinc or chloride of manganese, and then through a preparation obtained by the use of the sulphate of iron as described.

The claim is for the employment of chloride or sulphate of zinc, or chloride or sulphate of manganese, or chloride or sulphate of iron and lime mixed with wood sawdust or other suitable open porous matter in the purification of gas for illumination in the manner substantially as described.

2884.—MICHAEL HENRY, of 84, Fleet Street, in the City of London, for "*Improvements in the mode of, and apparatus for, carbonizing wood and performing other operations in which substances are treated by flame or heat.*" A communication. Patent dated Nov. 18, 1864.

One object of this invention is to carbonize wood. For this purpose, a moveable covered chamber is employed, in which fuel is placed and burned. Air is forced or driven under pressure into it so as to keep up combustion, and the flame, or ignited gaseous products of combustion, are discharged or projected direct from the chamber on to the wood to be carbonized. Water, steam, or other fluid, may be forced in by and with the air, and being decomposed by the heat the resulting gases combine with the products of combustion. The chamber should be moveable vertically and horizontally.

This method is also applicable to other operations in which flame or heat are applied in treating substances; as, for example, in reducing quartz and other rocks and minerals, and smelting and reducing ores and heating and smelting metals.

One apparatus suitable for the purpose consists of a covered chamber or fire-box, containing fuel. Into this chamber air is forced by a blowing-machine through a pipe, into which before it enters the chamber a jet of water is admitted, so as to be blown in with the air and be decomposed into its constituent gases. The fuel-chamber is provided with a burner, nozzle, or mouth, for projecting the flame on to the wood or substance under treatment, which is laid on rollers, so that it may be easily worked to and fro. The chamber is placed on a pillar or support, raised and lowered through guides by means of a lever or handle, and it can be moved horizontally by propelling the fulcrum or support on the lever in a circular guide-way or a platform.

2932.—JOHN KISSACK, of Liverpool, in the co. of Lancaster, iron-founder, for "*Improvements in warming and ventilating apparatus.*" Patent dated Nov. 24, 1864.

In carrying out this invention it is proposed to form in brickwork or masonry of any suitable external form, erected in any convenient place, such as a vault or cellar, at a lower level than the rooms or places to be warmed and ventilated, a furnace or fire-place, with the bars inclined downwards from the front to the bridge, or horizontal, in the usual way. The mouth of this furnace or fire-place and the front of the ash-pit are fitted with doors which can be closed almost air-tight, but they are provided with slides or shutters to regulate the supply of air to maintain combustion, the object being the economization of fuel. The arch is formed in any suitable way. The heated gases or products of combustion are led over and alongside, or either over or alongside the arch, into flues, where a number of pipes are disposed horizontally, or nearly so. These pipes are open at the surface of the brickwork or masonry, or if under cover they are continued to the outside of the main building to receive fresh air. At the back end, somewhere about the bridge of the furnace, the pipes converge and join into one, two, or more main flues, fitted with controlling dampers through which the air, heated to any desired temperature by regulation of the air admitted to maintain combustion in the furnace or fire-place, is led to the place or apartment to be warmed and ventilated, the heat imparted to the air being sufficient to cause a continuous inward current through the pipes.

2934.—FREDERICK SANG, of Buckingham Street, Adelphi, in the co. of Middlesex, architect and decorative artist, for "*A new or improved ventilating cupola-chandelier.*" Provisional protection only obtained. Dated Nov. 24, 1864.

It is proposed to fix over each chimney of the burners a trumpet-mouthed tube, a series of which converge to a central vertical tube or flue over the centre chimney, which also terminates in a bell mouth. Each of the trumpet-mouthed tubes is surrounded by an outer tube, or a casing for the admission of an upward current of cold air. These pipes or casings are united in one main tube surrounding the vertical hot-air tube from all the burners, and an opening or openings is or are made in the hot-air tube near the ceiling for the entrance of the outer or surrounding current of cold air into the hot-air tube. Openings are also made at the top of both the outer and inner tubes close to the roof for any heated air outside the chandelier to pass into the flues. The vitiated air is then conducted within the floor or roof to the chimney or other convenient outlet. The heat of the gas is thus carried off by single, double, or triple tubes, with cold air feeders going into a main flue, protected by an outer flue of either metal or earthen or stone ware, or into an ordinary brick flue.

2937.—JOHN WHITE, of Finchley, in the co. of Middlesex, for "*Improvements in means employed in purifying, changing the temperature, and impregnating atmospheric air; which improvements are also applicable to the purification or separation of gases or vapours, and part of which improvements is also applicable to obtaining motive power for other purposes.*" Patent dated Nov. 24, 1864.

These improvements relate to means or apparatus by which atmospheric air may be acted on for the purpose of its purification or its change of temperature or its impregnation. For this purpose, the air in motion obtained by a fan or other suitable blowing or forcing apparatus or means, or otherwise, is caused to pass through or between filaments, strands, or texture of wool, or of other suitable material, adapted to operate by capillary attraction to receive and hold in suspension water or other purifying, cooling, warming, or impregnating fluid, supplied from a suitable reservoir.

2960.—THOMAS GREENHALGH, of the city of Manchester, yarn agent, for "*Certain improvements in steam-engines and rotary pumps.*" Patent dated Nov. 28, 1864.

The first part of this invention is applicable to rotary steam-engines and rotary pumps, and it consists in applying a segmental-shaped piston to an annular cylinder; to this piston is cast or fixed a toothed wheel, gearing into another wheel fixed on the shaft to be driven; a valve is made to open and close at each revolution of the piston, and the ingress and exhaust ports for the steam are opened and closed alternately by suitable levers and valves. A modification of the invention consists in connecting the segmental piston, above referred to, to a lever or wheel fixed on an axle concentric with the annular cylinder. The second part of the invention is applicable to the same rotary steam-engines for which letters patent were granted to Martin and Hodgson, March 31, 1864 (No. 798), and it consists in casting or fixing wheels to the segmental pistons referred to in the specification of the said patent, which wheels are fixed to separate shafts, and are coupled to the fly-wheel shaft by cranks and rods or by gearing.

The claims are for the improved arrangements of machinery forming rotary steam-engines or rotary pumps as described, and particularly the mode of connecting the segmental piston to the fly-wheel shaft. Also for the improved mode of constructing semi-rotary steam-engines as described.

2984.—MICHAEL HENRY, of 84, Fleet Street, in the City of London, for "*Improvements in means or apparatus for indicating, signalling, registering, measuring, and stopping escapes of gas.*" A communication. Provisional protection only obtained. Dated Nov. 30, 1864.

The object of this invention is to ascertain, indicate, signalize, measure, register, and stop escapes of gas. For this purpose the action or variation of pressure of the gas acts on certain working appliances, the pressure moving or keeping them in certain positions or states, and the reduction of pressure consequent on an escape works or acts on such appliances so as to cause them to work visible signals, sounding or acoustic signals, and valves or other appliances for stopping the flow of gas; also registering tracers and measuring instruments. Such appliances may be liquids moved by the pressure of the gas, as in a gauge or otherwise, or they may be moveable chambers, vessels, or diaphragms, or telescopic or sliding cylinders, or other vessels or floats, or hollow plungers, or flexible discs, or vessels capable of expansion and contraction. They may be moved by weight caused to act by the effect of the pressure or variation of pressure of the gas-jointed revolving or sliding plates. Discs or arms may be used as visible signals, and whistles and vibrating tongues actuated by air or other aëriform fluids, gongs, strings, spirals, or other surfaces struck or sounded by hammers, springs, or other agents, directly or by floats, peg-wheels, or trundles, also instruments worked by electricity, may be used as audible or acoustic signals.

2998.—CHRISTOPHER BINKS, of 13, Rue Gaillon, Paris, in the empire of France, chemist, for "*Improvements in separating sulphur from coal and coke.*" Provisional protection only obtained. Dated Dec. 1, 1864.

The principal object of this invention is to purify coal and coke from sulphur, with the view of applying such desulphurized coal and coke as fuel in manufacturing, metallurgical, and other operations wherein the presence of sulphur is injurious. A subordinate object, in some cases, is the utilization of the sulphur or sulphur compounds obtained through these operations for desulphurizing the coal and coke.

When the sulphur in the coal which is intended to be desulphurized exists in the form of iron pyrites—that is, bisulphuret of iron—its separation from the coal is effected by one or other or by a combination of the following methods—that is to say:—

First method.—The impure coal is reduced to a fine powder, and this powder is mixed with water. Preferably the impure coal is ground or levigated in water, and atmospheric air, either of ordinary temperatures or artificially heated, is then passed into and through this mixture, in order thoroughly to agitate the mixture and suspend in or diffuse the mixed particles of coal and pyrites throughout the water. The agitation of the mixture is caused to cease by staying the admission of the atmospheric air, and the mixture is left to rest until the particles of pyrites, by reason of their superior gravity, shall either wholly or partly have separated from the coal and settled to the bottom of the reservoir or apparatus in which the operation is carried on.

The agitating and settling apparatus is so constructed that the deposited pyrites can be flushed or carried off from the bottom, leaving the coal either still suspended in the water or lying in a deposited stratum above the pyrites, or otherwise so constructed that the suspended coal, or, when it has been deposited, the stratum of coal, can be washed off from the deposited pyrites.

These operations of alternately agitating the impure coal pulp by currents of air, and leaving the pulp to stand till its heavier constituents separate by subsidence, is repeated as often as necessary when one such operation is not sufficient, and until the whole or the greater portion of the pyrites is thus mechanically separated from the coal. The invention is not confined to the use of air as the agitating agent, but, at pleasure, any other convenient mechanical agency may be employed for alternately agitating the mixture of pulverized impure coal and water, and leaving it at rest to effect the separation of the pyrites from the coal.

Second method.—The above, or first method, is used to separate pyrites from coal, where it is desired that this operation should be accomplished by mere mechanical appliances, as herein above specified. But by this second method the aid of certain chemical agencies is brought into action, to be used conjointly with the mechanical appliances above described—*i.e.*, the pulverized impure coal is exposed, mixed with water, to the action of atmospheric air, so applied and continued as to oxidize all or a portion of the pyrites mixed with the coal, and because of such oxidation to convert the previously insoluble bisulphuret of iron into soluble sulphate of iron and free sulphuric acid, which products are capable of being separated from the residual coal by washing or lixiviation. In this operation, the aërating and agitating action, by passing atmospheric air at ordinary temperatures into and through the impure coal pulp, is prolonged till the oxidation of the pyrites, or of such a portion of it as it may be desired to oxidize, be completed. But it is preferred, in place of applying the air at its ordinary atmospheric temperatures, to employ heated air or air mixed with ordinary steam, or superheated steam, to accelerate the natural oxidizing action of the air, and moisture on the pyrites. The products of this oxidation, consisting chiefly of proto-sulphate of iron and free sulphuric acid, are then removed by washing or lixiviation, and the previously impure coal is thus left either completely or partially desulphurized, and any unoxidized portion of pyrites can be removed by the mechanical action of subsidence as before described.

Third method.—The impure coal is reduced to the condition of a fine powder, and the more impalpable its particles the better. The pulverized coal is exposed, made up into heaps or beds, to the natural oxidizing action of the air and moisture, till the particles of pyrites have been transformed into sulphate of iron and sulphuric acid. These soluble products are then washed out, and the desulphuration of the coal thus effected.

It is preferred to use a covered shed, on the floor of which to spread the coal, and when the natural moisture in the coal or the hygrometric water of the atmosphere are not sufficient to supply the water of composition requisite to the formation of hydrated sulphuric acid, such water is added to the coal. The underground of the floors of the sheds is so constructed, that any water thrown upon the bed of coal, and made to percolate through it, can be drained off, and the products of the oxidation of the pyrites be conveyed to suitable reservoirs for the after-treatment in utilizing them.

It is preferred to aid the natural oxidizing action of the atmospheric air and moisture on the iron pyrites in the coal by the application of artificial heat to the heaps or beds of impure coal, and for this purpose heated air is drawn into the sheds, either by currents passing over the surface of the coal, or by means of flues constructed below the floors and conveying heated air beneath or through the beds, or conveying thereto a mixture of heated air and steam.

The sulphur compounds so produced are then separated from the coal by washing them out or by lixiviation by any convenient arrangements. These compounds are of themselves valuable products, and can be further utilized in the manufacture of other products. The washed and desulphurized coal can be air-dried or kiln-dried, or in its wet or pasty condition be used as fuel or for the manufacture of coke or of gas, and in most kinds of metallurgical and manufacturing operations.

The improvement in desulphurizing coke is as follows:—To coke which has been manufactured from coal contaminated with iron pyrites, water is applied acidulated with some kind of acid capable of forming with the proto-sulphuret of iron left in the coke a soluble salt of iron, and at the same time of liberating the sulphur in the form of gaseous sulphuretted hydrogen, which is expelled and escapes. The residual salt of iron is, at pleasure, either separated from the coke by lixiviation, or it is left mixed with the coke when its chemical composition makes its presence to be harmless or advantageous in the after applications of the desulphurized coke.

3005.—THOMAS WOOD GRAY, of 1, Margaret Street, Limehouse, in the co. of Middlesex, engineer, for "*Improvements in pumps.*" Provisional protection only obtained. Dated Dec. 2, 1864.

This invention relates to improvements in that class of pumps known as Downton's pumps. As usually constructed, this pump is composed of three pistons, or buckets, from each of which a rod rises to a cross-head or slide, which works in suitable guides, and each slide has a slot formed in it, in which is received a cam surface, carried by a crank, a separate crank and cam surface being employed for each slide, and the three cams being all carried on one axis. All the slides thus have motion transmitted to them on the rotation of the axis.

These improvements consist in applying guide-rollers to the working surfaces of the slides above mentioned, in order that the slides may move to and fro with less friction than heretofore; and also in applying a roller, or rollers, to one or more parts of the working surfaces of the cams that act on the slides, in order that the cams may give motion to them with less loss from friction than heretofore.

3013.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, in the City of London, for "*Improvements in apparatus for heating and cooking by gas.*" A communication. Provisional protection only obtained. Dated Dec. 3, 1864.

This apparatus for heating air consists of a row of gas-jets, and of a simple jet set near the end of the row, of a space for storing up the heat, and of a reflector which dispenses and distributes the heat. Slightly modified, the inventor uses the apparatus for heating water as well as air. The invention cannot be fully described without reference to the drawings.

For cooking, the apparatus consists of a metal case, which is provided with a ring burner with several jets, and above it stages of double discs, which extend entirely across the case. The double discs are formed with openings in the centre of the lower plate of the double disc, and with apertures near the edge of the upper plate, through which the heated air passes, until it finds its exit through a perforated plate in the top of the case.

3021.—HENRY WILSON, of Stockton-upon-Tees, in the co. of Durham, for "*Improvements in pumps.*" Provisional protection only obtained. Dated Dec. 5, 1854.

These improvements consist first in so constructing the connecting-rods for working the buckets or plungers of pumps, that two, three, or more buckets or plungers may be worked in the same chamber, each bucket being lifted by the centre instead of by the side as heretofore when more than one bucket has been used. The second improvement consists of an arrangement whereby the whole of the buckets may be lifted out of the pump for examination or repairs by simply removing the lid or cover of the pump. The third improvement consists in constructing the valves of buckets, so that they will close rapidly whilst working, which is done by making the disc of leather or other elastic material through which four or more incisions are made radiating from the centre, thus dividing the disc into segments. On each of these segments is riveted a piece of brass or other metal, and this segmental disc is attached to the upper side of a sliding disc of leather or india-rubber, which is fixed on the grate or upper part of the bucket in the usual way to form a valve.

APPLICATIONS FOR LETTERS PATENT.

2259.—CHARLES HORSLEY, of Wharf Road, City Road, London, civil engineer, for "*Improvements in meters or apparatus for measuring water or other fluids, partly applicable for exhausting air or other gases.*" Sept. 1, 1865.

2270.—STEPHEN KETTLE, of 41, Goswell Street, Clerkenwell, London, for "*Improvements in water-closet apparatus, urinals, and the like, and appliances thereto.*" Sept. 4, 1865.

2308.—ALEXANDER MACKIE, of Warrington, Lancaster, newspaper proprietor, and JAMES PATERSON, of the same place, engineer, for "*Certain improvements in the method of lighting gas, and in apparatus connected therewith.*" Sept. 9, 1865.

GRANTS OF PROVISIONAL PROTECTION.

1968.—FERDINAND KÜP, of Frankfort-on-the-Maine, gentleman, for "*Improvements in gas-burners.*" July 29, 1865.

2040.—ADOLPH MILLOCHAN, of the city and state of New York, U.S.A., for "*An improvement in stills for the distillation of petroleum and other oily substances.*" Aug. 15, 1865.

2043.—ADRIENNE ANASTASIE FOUBERT, of St. Heliers, Jersey, for "*Improvements in apparatus for regulating the passage or flow of steam, water, and other fluids.*" Aug. 7, 1865.

2094.—HENRY WOODWARD, of Cannon Street, in the City of London, gas engineer, for "*Improvements in gas-burners.*" Aug. 12, 1865.

2128.—NICHOLAS CHARLES SZERELMEY, of 90, Belgrave Road, Pimlico, London, gentleman, for "*Improvements in the manufacture of paper-boards and pipes.*" Aug. 17, 1865.

2167.—JOHN NEWTON, of Preston, Lancaster, civil engineer, for "*An improved gully or stench-trap for the prevention of the escape of noxious effluvia from drains or sewers, and for preventing the ingress of sand or other solid matters into the same.*" Aug. 23, 1865.

2179.—GIACOMO BAGNAGATTI, of Leicester Square, London, for "*An improvement in gas-burners.*" Aug. 24, 1865.

2191.—JOHN MOULE, manufacturing chemist, of 391, Hackney Road, London, for "*An improvement in the treatment of tar and other substances suitable to be used in the manufacture of paint, and for other purposes.*" Aug. 25, 1865.

2199.—ROBERT GORDON RATTRAY, of Aberdeen, M.D., for "*Improvements in apparatus for supplying regulated or measured quantities of water.*" Aug. 26, 1865.

2220.—WILLIAM HENRY GUMMER, of Rotherham, York, for "*An improved stench-trap and sink-pipe protector.*" Aug. 29, 1865.

2259.—CHARLES HORSLEY, of Wharf Road, City Road, London, civil engineer, for "*Improvements in meters or apparatus for measuring water or other fluids, partly applicable for exhausting air or other gases.*" Sept. 1, 1865.

INVENTION PROTECTED FOR SIX MONTHS BY THE DEPOSIT OF A COMPLETE SPECIFICATION.

2270.—STEPHEN KETTLE, of 41, Goswell Street, Clerkenwell, London, for "*Improvements in water-closet apparatus, urinals, and the like, and appliances thereto.*" Sept. 4, 1865.

NOTICES TO PROCEED.

1266.—ISRAEL SWINDELLS, of Wigan, Lancaster, chemist, for "*Improvements in the manufacture of coal gas.*" May 6, 1865.

1386.—WILLIAM DAVEY, of the Imperial Tar-Works, White Post Lane, Hackney Wick, London, for "*Improvements in apparatus for washing or purifying coal gas, and for producing ammoniacal water therefrom.*" May 19, 1865.

2095.—HENRY WOODWARD, of Cannon Street, London, gas engineer, for "*Improvements in carburetting coal gas and manufacturing artificial gas, and in the machinery or apparatus employed therein.*" Aug. 12, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2373.—JOHN AMBROSE COFFEY and THEOPHILUS REDWOOD, "*Improvements in the manufacture of salts of ammonia and other products from the ammoniacal liquors of gas-works, and animal charcoal-works, and in the still or apparatus to be used in such manufacture.*" Aug. 27, 1862.

2390.—ELIZABETH LACHENAL, "*Improvements in gas-meters.*" Aug. 28, 1862.

2421.—WILLIAM CLARK, "*Improvements in the means of obtaining light and heat, and in apparatus for the same.*" Sept. 1, 1862.

2423.—JOHN HENRY JOHNSON, "*Improvements in apparatus for regulating or controlling the working of motive-power engines, applicable also to the regulation of the flow of liquid, air, or gas through pipes or conduits.* A communication. Sept. 1, 1862.

2458.—SIDNEY HOPTON HADLEY, "*An improved process for manufacturing gas for illumination.*" Sept. 5, 1862.

PATENT WHICH HAS BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

1942.—WILLIAM ESSON, "*Improvements in wet gas-meters.*" Aug. 27 1858.

Died at his residence in Northampton, on Sunday, the 10th inst., THOMAS SHARP, Esq., in his 81st year. Mr. Sharp, who for many years was manager of the Northampton Gas-Works, was, on the passing of the Act for establishing county courts, appointed treasurer, under the Act, for the counties of Berkshire, Oxfordshire, part of Buckinghamshire, and part of Northamptonshire; but he still maintained his friendly relations with his old brethren of the gas profession, by whom his kindness of heart, excellent judgment, and good, common sense, were much appreciated.

NEW SMOOTHING IRON.—A self-heating iron for smoothing clothes has been recently patented in America. It is hollow, and has within it a gas-pipe, which is supplied with gas by a flexible tube connected with the handle. In the gas-pipe are a few small apertures that constitute jets, which furnish minute flames. The upper portions of the iron are most heated; but when the lower has become too cold for use, the position of the upper and lower surfaces, both of which are perfectly smooth, can be easily reversed.

A SHIP BLOWN UP.—A serious explosion occurred on board the barque *Mary Adelia*, lying in the Great Float, Birkenhead, on Monday morning, the 4th inst. The vessel had just been loaded with a cargo of Welsh coal for exportation to Brazil. At about half-past eight o'clock the shipkeeper went down the hole and ignited a match for the purpose of lighting a lamp. Immediately upon the match being lit, the gas, which had generated in the hole from the coal, exploded. The shipkeeper fortunately escaped with no further injury than a severe scorching of his face and hands, and no other person was on board at the time. The vessel, however, was much damaged, the beams of the main deck and the upper portion of the stern being carried away by the explosion, and all the deck houses shifted from their places. The ship belongs to Messrs. Taylor, Tipper, and Co., of Liverpool.

Miscellaneous News.

NEWCASTLE AND GATESHEAD GAS COMPANY.

The Annual Meeting of the Shareholders of this Company was held on Wednesday, September 6, at noon, in the Offices in Neville Street, Newcastle—JOHN CLAYTON, Esq., the chairman of the directors, presided. The seal of the register of shareholders having been affixed to the previous year's minutes of their proceedings,

The CHAIRMAN said they had now to consider the report of the directors and the statement of accounts for the twelve months just ending.

The following is the report, which was taken as read:—

The directors, in performance of their duty, present to the shareholders the yearly statement of the accounts of the company, from the 1st July, 1864, to 30th June, 1865. The balance appearing on that statement to be applicable to dividend is £17,793. 11s. 4d. The directors recommend the declaration of a dividend of 10 per cent. on A stock, and 3½ per cent. on B stock for the year, of which one-half has already been paid in advance to the shareholders. The unappropriated balance to be carried forward to the credit of the current year's account.

In accordance with a resolution at a special meeting, held in June last, the directors have completed the purchase, and entered into possession of the Blaydon Gas-Works. Extensions during the year have been made to Hebburn, Felling, Swalwell, Whickham, and other places. These investments of capital have been effected under the borrowing powers conferred by the Act, and are expected to prove beneficial to the company.

Under the provisions of the company's Act of Incorporation, the then existing directors and auditors were continued in office till the present meeting. At the time of the passing of the Act, they consisted of Messrs. J. Clayton, M. Anderson, F. Staniford, T. W. Keenlyside, G. Bargate, W. Douglas, W. Brown, J. Kimpster, and W. Woods; Mr. J. H. Richardson, and Mr. R. White being auditors.

At the last annual meeting Mr. W. Kimpster was appointed a director in the room of Mr. Woods, deceased. Since then, Mr. Bargate, one of the directors, and Mr. J. H. Richardson, one of the auditors, are dead; the rest of the directors and the remaining auditor retire, but offer themselves for re-election.

The CHAIRMAN said the report would be sufficiently clear to need no comment; but, by way of explanation, he would just observe that upon the revenue account the balance in hand at the beginning of the year was £2600, but that had been largely reduced, so much so, that it had been brought down to £2300 odd. That reduction had been caused by the renewal of works in different localities, which was not likely to occur again for some time to come. On the subject of dividends he would ask the shareholders to pass a resolution, so that the directors hereafter might be able to make a half-yearly dividend. It was a great convenience to many shareholders to receive their dividends half yearly, and he hoped that the unauthorized proceedings of the directors six months ago—that of giving a half year's dividend—would be hereafter confirmed. He then moved the following resolutions:—"1. That the report and accounts now presented be approved and adopted. The remuneration of the directors be as heretofore at the rate of £1 per meeting. That the payment to the auditors be £10. 10s. each per annum, and that the salary of the secretary be £300 per annum. —2. That a dividend at the rate of 10 per cent. per annum upon the A stock, and of 3½ per cent. per annum upon the B stock (of which one-half was paid in February last) be now declared for the year ending 30th June last, and that the balance be payable by warrants to the shareholders on the 7th inst.—3. That the shareholders approve of the payment of the annual dividend by half-yearly instalments, and authorize the directors to make annually such a payment for the half year ending 31st December, as in their judgment will fairly represent one-half of the divisible profits of the current year."

Mr. GREEN asked the reason of the increased salary to the secretary.

The CHAIRMAN said the duties of the secretary had been very materially increased of late, owing to the extensions of the company, which they would all observe in the report. Those duties, notwithstanding their increased and more onerous nature, had been very satisfactorily performed, and, looking at the salaries paid to other secretaries in similar companies, the directors thought it due and just to Mr. Hardie to propose an addition to his salary.

Mr. GREEN asked if there had been any addition of clerks in the offices.

The CHAIRMAN said there had, and for the reason which induced the directors to propose an increase to the secretary's salary they had deemed it just to advance the pay of those who were employed in the office. Those salaries, however, were in the sole power of the directors according to law, and they could increase or decrease them as they thought necessary. The salary of the secretary was differently ruled, and what the directors did in respect to it had first of all to be submitted to their consideration.

The CHAIRMAN said their next business was the appointment of a board of directors for the ensuing year. Since their last annual meeting Mr. Bargate had died, and though the officiating board of directors had the power to make an *interim* appointment, they were unwilling to do so, as they believed it might prejudice any choice the shareholders were desirous of making at that meeting. The old directors were—Messrs. J. Clayton, M. Anderson, F. Staniford, T. W. Keenleyside, W. Douglas, W. Brown, Joseph Kimpster, and William Kimpster, and there was a vacancy to be filled up, owing to Mr. George Bargate's death. All offered themselves for re-election, and in the room of Mr. Bargate any gentleman might be nominated whom the shareholders thought fit to be elected.

Mr. B. PLUMMER nominated Mr. Thos. Hedley as a fit and proper person to serve as a director.

Mr. CHALLONER seconded the nomination.

Mr. HOLMES proposed Mr. Archibald Singers.

Mr. WATSON seconded the proposition.

Mr. CHALLONER said he observed by an old Act of Parliament they had the power of electing twelve directors, if they thought it desirable. Now, on the present occasion, they had two very suitable gentlemen who expressed their willingness to act as directors, and he put it as a suggestion whether they should now elect twelve directors instead of their present number.

Mr. KEENLEYSIDE said they could not do so, as an alteration like the one proposed required a notice of motion. A special meeting, however, could be called if it were thought necessary to increase the present board of directors.

Mr. G. H. BURNETT thought it would be very advisable to do so, as he believed that the shareholders in the west were not so well represented as they might be. He frequently heard complaints of the insufficient pressure of gas at Blaydon, and likewise at other places in the west.

The CHAIRMAN said that, as far as they were concerned, they had had no complaints from Blaydon.

Mr. STANIFORD said he could explain, in a few words, the reason of the late insufficiency of gas in the west. Several alterations in the works had been made, and were going on at the present moment, and these, he could presume, would be completed in the course of a few days.

Messrs. John Clayton, Matthew Anderson, William Douglas, Francis

Staniford, William Brown, T. W. Keenleyside, Joseph Kimpster, and William Kimpster were then re-elected directors for the ensuing year.

A show of hands was taken for the gentlemen who had been nominated to the vacant office of directorship, and was largely in favour of Mr. Hedley.

Mr. HOLMES, on behalf of Mr. Singers, demanded a poll, and the chairman then appointed that afternoon for the election, the polling to be returned until four p.m.

The meeting then separated, and at five o'clock the polling was declared as follows :—For Mr. Hedley, 357; for Mr. Archibald Singer, 305. Majority in favour of Mr. Hedley, 52.—*Northern Daily Express.*

UNITED GENERAL GAS COMPANY.

The Half-Yearly General Meeting of Proprietors of this Company was held on Tuesday, September 5, at the London Tavern, Bishopsgate Street—ROBERT HUDSON, Esq., chairman of the company, presiding.

The SECRETARY read the advertisement convening the meeting, and also the following report:—

The directors have to submit the following report and accompanying accounts of the operations of the company, by which it will appear that the profits for the half year ending June last, amount to £10,191. 1s. 11d.

Dr. *Abstract of the Profit and Loss Account, for the Half Year ending June 30, 1865.* *Cr.*

To Coals used			£18,670	12	2	
Lime			295	9	2	
Wages paid			4,696	15	6	
Wear and tear			2,709	4	1	
Meters and repairs thereof			1,109	7	6	
Public lamp repairs			262	9	0	
Rents, rates, and taxes			746	6	8	
Directors	£600	0 0				
Auditors	42	0 0				
			642	0	0	
Salaries and collectors commission			2,429	5	9	
Charges and pensions			1,254	11	11	
Bad debts and allowances			1,006	14	9	
Property-tax			261	6	1	
Interest for balance of account			188	16	6	
Investment for amount as "Deterioration of works"			2,000	0	0	
			£36,272	19	1	
Net profit carried down			10,191	1	11	
			£46,464	1	0	

By Gas-rental for light						£38,123 13 4
Residual products						7,937 9 2
Proportion of half year's interest on Cork mortgage bond						402 18 6
						£46,464 1 0

Dr. *Appropriation or Dividend Account.* *Cr.*

To Dividend on 9000 shares, at £1 per share	£9,000	0 0				By Reserve account	£2,903 12 9
Bonus on ditto, at 3s. per share	1,350	0 0				Net profit brought down	10,191 1 11
			10,350	0	0		
Balance of unappropriated profit			2,744	14	8		
			£13,094	14	8		£13,094 14 8

Dr. *Abstract of the Balance-Sheet, June 30, 1865.* *Cr.*

To Capital					£450,000	0	0	By General investment	£429,768 6 7
Unpaid dividends					1,854	3	10	Hibernian Gas Company's stock and products	£31,014 17 2
Sundry personal accounts for store					11,281	16	11	Retorts, meters, fire-goods, services, &c.	8,222 1 0
Reserved fund, being the amount received for sale of lease of Austin Friars premises					4,900	0	0	Dublin Gas Bill costs	205 17 9
Cork Consumers Gas Company			£2,778	6	0	Due from bankers	1,066 15 3
Ditto interest on ditto bonds			1,592	17	4	Mount Town leasehold	450 0 0
			4,371	3	4		40,959 11 2
Insurance account			1,382	6	9	Stock and products at Limerick	£4,293 19 5
Loan account			3,000	0	0	Retorts, fire-goods, tubing, &c.	625 17 5
Bills payable			7,228	14	3	In hands of the agent	24 8 3
Dividend reserve-fund			£2,903	12	9		4,944 5 1
Current profits			10,191	1	11	Stock and products at Bray	£709 11 5
			13,094	14	8	Retorts, meters, and fire-goods	367 9 0
						Due from bankers	330 14 11
							1,407 15 4
						Law and parliamentary costs	906 10 10
						United General Gas shares	97 0 4
						Coals in transit	1,877 9 11
						Due from sundry persons and accounts	705 8 1
						Bills receivable	1,011 13 5
						In hands of bankers	£1,538 18 0
						Petty cash	4 11 0
							1,543 9 0
						Cork Consumers gas bond	18,891 10 0
					£497,112	19	9		£497,112 19 9

The annexed accounts were taken as read:—

The CHAIRMAN then said—Gentlemen, I can only say that we are always pleased to see you here at our half-yearly meetings, because it gives us an opportunity of explaining to you what we have been doing since the last meeting, and of answering any questions that may be put to us. The accounts speak for themselves. There are some things which are very satisfactory, and there are others in which we should be glad of improvement, and we hope to see improvement in them. There are other questions which, with that mutual good understanding which has always existed between the proprietors and the directors, I should rather have liked to have gone into; but I am quite sure that you, as men of business, will see that the present is not the time for so doing. I think you will the more readily agree in this when I tell you that a large deputation of your directors will shortly go to Dublin. There are one or two things which, I think, are satisfactory. One question which has often been alluded to is the leakage. We have had a good deal of expense with regard to our large trunk mains, but I am happy to say that our leakage is reduced from 20·90 to 16·16. That is, so far, satisfactory. It likewise shows, of course, that the gas made during the half year has been less than in the previous half year, whilst the gas sold has been a good deal more, which shows that we have not been losing so much gas as we formerly were. There are other matters which I do not think it necessary for me to detain you with at this time, but as I have before said, I shall be very happy to answer any questions which any proprietor has to put. In the meantime, I beg to move that the report which has been read, and the accounts which have been taken as read, be received and adopted.

Mr. SMYTH: I beg to second that.

Mr. STOKES: I see you have sold the lease of the old premises in Austin Friars for a very large sum, and I should like to inquire how long that lease had to run.

The CHAIRMAN: It had 12 years to run.

Mr. STOKES: I can only congratulate the directors upon having sold it for a very handsome sum.

Mr. DOANE: If you turn to the balance-sheet, you will see on the credit side two items—"Dublin Gas Bill costs, £205, and law and parliamentary costs, £906." I want to ask whether those are the total expenses of the last parliamentary campaign, or are they payments on account.

At Dublin, the increase of business has been satisfactory. The returns for coke have not realized so large an amount as was obtained during the corresponding period last year.

The reorganization of mains and services has been completed. There has been a considerable diminution of leakage during the half year.

The directors applied for an Act of Parliament during the last session, which did not, however, pass the committee of the House of Lords; but it is intended to apply again during the ensuing session.

The increased demand for gas at Dublin requires an extension of retort power, together with new roof to retort-house and additional settings, involving a moderate outlay; these will be completed in time for the next winter's operations.

At Limerick, the improvement on both rental and sales of coke has been satisfactory.

An opportunity having occurred for the sale of the lease of the Austin Friars premises, your directors disposed of the same, and new offices have been taken in Jeffrey's Square.

The profits, as before stated, amount to £10,191. 1s. 11d., which, added to the dividend reserve-fund of £2903. 12s. 9d., makes a total of £13,094. 14s. 8d., from which the directors recommend that a dividend of 20s. per share, and a bonus of 3s. per share, amounting to £10,350, both free of income-tax, be declared payable on and after the 2nd of October next.

Three of the directors—Mr. Hudson, Mr. Stephenson, and Mr. Wheeler—and Mr. Wheeler, jun., one of the auditors, go out of office this day, by rotation, and being eligible, offer themselves for re-election.

The CHAIRMAN: I can only say I wished we had managed so well as to have got off at so small a sum. They are only payments on account.

Mr. DOANE: I then go to the working expenses for the half year, and I find that your profit on the gas-rental is 27½ per cent., whereas last year, at the corresponding period, it was 28½ per cent. Perhaps, you will have the goodness to explain that. The metropolitan companies make a profit of 40 per cent., and if we could do the same it would make an enormous difference to us in dividends.

The CHAIRMAN: I think I can answer the honourable proprietor's question. With respect to one item—that of coke—I may say that we have not been able to dispose of our coke as we did before. I believe we are £1200 less upon that item. Our coals during the last half year have cost us nearly a shilling per ton in advance. We likewise have reduced the price of our gas. I think that is quite sufficient to account for the diminution which has taken place.

Mr. DOANE: Then we must be content with 27½ per cent.

The CHAIRMAN: I do not say that, because we hope another year we may get a larger profit.

A PROPRIETOR: I should like to ask how the directors are paid.

The CHAIRMAN: £1200 a year.

A PROPRIETOR: I think that is too large a sum.

Mr. STOKES: I am one of those who think the sum paid to the directors is not too large. I think the directors having considerable work to do ought to be properly remunerated.

The resolution for the adoption of the report and accounts was then put, and carried unanimously.

Mr. STOKES: I beg to propose that a dividend of £1 per share, and a bonus of 3s. per share, both free of income-tax, be declared out of profit and the reserve-fund for the last half year.

Mr. SMYTH: I beg to second that motion.

The resolution was carried unanimously.

The retiring directors and auditor were then re-elected.

The CHAIRMAN: On the part of my colleagues and myself, and likewise in the name of the auditor, who is unable to be present with us to-day, I thank you exceedingly for the confidence which you have placed in us. I can assure you we do our utmost to promote your interests as well as our own, for we are large shareholders with you. As far as our remuneration

goes, you voted it to us; whether it had been £600 a year or £1200 it would have made no difference whatever in the way in which we wished to act, so as to entitle ourselves to that confidence which you have so kindly again placed in us.

On the motion of Mr. STOKES, a vote of thanks to the chairman and directors for their able management of the company's affairs during the past half year was unanimously carried; and a suitable acknowledgment on the part of the chairman brought the proceedings to a termination.

CITY OF LONDON COURT OF SEWERS.

GUILDHALL, TUESDAY, SEPT. 12.

At the Meeting of the Commission this day—Deputy DE JERSEY in the chair,

Dr. LETHEBY laid before the court the following

RETURN *of the Quality of the Gas supplied to the City of London, for the Quarter ending Saturday, August* 26, 1865.

Illuminating power: Sperm = 120 grains per hour.

	City Company.	Chartered Company.	Gt. Central Company.
Maximum	16·98	15·50	16·50
Minimum	12·86	12·98	12·52
Average	14·19	14·33	14·23
Total number of observations in the quarter	219	219	218
Ditto ditto when under standard	None.	None.	None.
Amount of sulphur present (grains) per 100 cubic feet.			
Maximum	25·0	26·3	32·1
Minimum	15·5	14·6	21·8
Average	18·70	19·58	25·81
Total number of observations in the quarter	51	51	51
Ditto ditto when in excess of standard	10	21	51
Sulphuretted hydrogen	None.	None.	None.
Pressure of the gas in tenths of an inch of water.			
Maximum	2·9	1·7	2·3
Minimum	0·7	0·9	1·0
Average	1·38	1·2	1·43

Remarks.—In the course of the quarter ending in August last, there have been 656 examinations of the illuminating power of the gas supplied by the three City companies, and the results are that the illuminating power of the Great Central gas has averaged 14·23 standard sperm candles; that of the Chartered, 14·33; and that of the City Company, 14·19 candles. The illuminating power has not in any case been under the requirements of the Act of Parliament.

With respect to the chemical quality of the gas, I have to report that the City and Great Central gas has always been free from ammonia, and that of the Chartered Company has been always highly charged with it. As regards the proportion of sulphur in the gas, the weekly averages of the City and Chartered Companies have rarely shown an excess of this impurity, but the gas of the Great Central Company has been always overcharged with it. While, for example, the quarterly average of the City gas has been but 18·7 grains, and that of the Chartered 19·58, the proportion in the Great Central gas has been nearly 26 grains.

Lastly, I have to report that the gas of each company has been always free from sulphuretted hydrogen, and that the average pressure at which the gas has been supplied to the public has been above an inch of water.

(Signed) H. LETHEBY,
Gas Analyst for the City of London

METROPOLIS GAS SUPPLY.

A Meeting of Delegates from South London parishes supplied with gas by the Surrey Consumers Gas Company, was held on Tuesday evening, the 12th inst., in the Vestry-Hall, St. John's Horsleydown, to consider what steps could be taken to improve the quality, increase the quantity, and reduce the price of gas supplied to the district.

Mr. WILKINSON (churchwarden of St. John) was voted into the chair, and there were also present—Messrs. Barrett, Serle, Cox, Wilkinson, T. P. Slee, Bishop, Rendle, Tolhurst, Clark, Elworthy, Daws, Marks, Barlow, Baxter, Battersby, and Chandler, who represented the parishes of St. John, St. Olave, Bermondsey, and Rotherhithe.

Mr. ROBERT SLEE acted as secretary to the meeting, and made a statement as to what had transpired at the various parish meetings by which the delegates had been appointed.

The CHAIRMAN asked if the shares of the Surrey Consumers Company had been paid up. This was an important question, inasmuch as the company had been paying 10 per cent. on the full amount of the shares.

Several gentlemen expressed an opinion that the shares had been paid up.

Mr. BARRETT thought the first step was to arrange for a deputation to the Surrey Consumers Gas Company, and lay before the directors their complaints about the impurity, deficient supply, and increased price of gas, as well as the increased register of it.

Mr. COX agreed with the previous speaker.

Mr. SERLE urged that the meeting must make out their case before forming themselves into a deputation.

Mr. BISHOP considered the grievance of which the deputation had to complain had been made out in the resolutions passed at the meetings by which they, the delegates, had been appointed. He then read the resolutions in question, and proceeded to state that at the committee to which he belonged, consisting of gentlemen from Bermondsey and St. John's, a resolution had been passed expressing an opinion that it would be desirable to ask for a reduction of 1s. per 1000 feet next Michaelmas, and a further reduction of 6d. six months after. The South Metropolitan had reduced their price to 3s. 6d., and it was only fair for the Surrey Company to reduce their price at once to the same amount. The Independent also had made a reduction, first to 3s. 6d., and then at Michaelmas there would be a further reduction to 3s. 4d. Mr. Croll had stated in evidence that good gas could be supplied at 3s., and so he thought these facts would warrant the request for the full reduction he had mentioned.

The CHAIRMAN and other gentlemen asked Mr. Bishop if he had any further reasons for asking for a reduction below the price charged by the South Metropolitan.

Mr. BISHOP stated that provincial towns were supplied at 3s., the lowest price he had mentioned, and the Surrey Consumers Company no doubt could afford to charge the same price, as they were very favourably situated for landing coal, iron, and other material, their works being on the banks of the river.

Mr. RENDLE urged that it would be useless to argue with the directors of the company about the cost of producing gas, as they were *au fait* on the question, and could at once pose the deputation by a single question only. He did not think they could go and demand a reduction in price, in accordance with either the spirit or the letter of the Act. The spirit and letter of the Act was that the per centage paid to the vendor was to regulate the price of gas, and so the argument of analogy by comparing companies would not be either a potent or an appropriate one. The reduction should be requested on a broader basis, such as the growing dissatisfaction of the public and the expected benefits conferred upon the companies by the recent Act, in which the shareholders ought to partake. Their business, he conceived, was simply to carry out the resolutions to which Mr. Bishop had alluded. An important fact had come to his knowledge, for he had ascertained that there were works nearer to them than those at Rotherhithe, where gas was necessarily made in the manufacturing process carried on there. This manufacturer would be only too glad to supply his gas at 6d. per 1000 feet, and he was ready to supply any amount of it, as the other products were commercially valuable. In fact, he would at the outset be ready to give the gas for nothing. The works were now in their infancy, but could and would be extended if necessary. The gas was produced from tan, and the gas-mains in Bermondsey ran close up to the works. He had advocated that the streets and all beneath them should be the property of the parochial authorities, but he did not think they should manufacture their own gas, but rather that they should contract for it to be supplied to them by private persons or companies. This would give the advantages of both competition and monopoly. The communication they were about to send to the directors of the company should be as little dictatorial and as respectful as possible, whilst it should point out to them the commercial advantages of reducing the price of gas, and that other companies were making such reductions. As to the increased register of gas, he had tested this by the public lights in the district where they were now met, in which there were certain lamps tested by meter, by which all the other lamps were regulated. As to these lamps, there had been a decreased consumption in the quarter ending Lady-day this year, as compared with the corresponding quarter last year. In some cases, however, one lamp had had a decreased, whilst another had had an increased consumption. The consumption in the office of their district board registered less for the quarter ending Lady-day than for the same quarter in the previous year. He did not doubt the testimony of private consumers as to there having been an increase in the register of gas, but the above were facts that could not be rebutted. He would advise, therefore, that this question should not be raised at their interview with the company, but should be left with the private consumers themselves. In his judgment they should confine themselves to the one question of price, and to that alone.

The SECRETARY knew that there was a very large consumption of tan in a way that the tanners could not account for.

Mr. RENDLE stated that the Tan Gas-Works to which he alluded were at the bottom of Wild's Rents, and reached as far as the Bermondsey New Road. He understood that Mr. Croll had offered to supply gas ready for distribution at 2s. per 1000 feet, and he knew that it could be so supplied at 1s. At Torr's works, too, a large quantity of gas was necessarily made in producing animal charcoal, and they economized it by using it to light the factory and to heat their furnaces.

Mr. ELWORTHY considered that all the difficulties they were labouring under arose from Southwark not being a body corporate, for if it were they could manufacture and supply their own gas. Looking at the increased cost of gas to the consumers, there must be clearly some means of making the meters register more than they did formerly. In the first place there should be an interview with the directors, and then a public meeting should be held to originate a movement for securing a repeal of the clause in the Act authorizing the districting arrangements. The Surrey Consumers Company were not at the outset supported as they should have been, and so, he had no doubt, they were now retaliating upon the consumers.

Mr. RENDLE pointed out that some immediate steps must be taken in this matter, but there could be no repeal of any Act at the earliest for some months.

The SECRETARY and other gentlemen agreed that the quality of the gas had lately improved, and that the company were taking means to give an increased supply by laying down larger mains.

Mr. BARRETT, of Rotherhithe, moved—"That this meeting form itself into a deputation to wait on the directors of the Surrey Consumers Gas Company, to urge upon that corporation the necessity of making a reduction in the price of gas from the maximum price of 4s. 6d. per 1000 feet."

Mr. BARLOW, of St. John's, seconded the motion, which was carried.

Mr. TOLHURST, of St. Olave's, moved, Mr. BISHOP, of Bermondsey, seconded, and it was resolved—"That Mr. Slee be requested to write on behalf of this meeting to the Surrey Consumers Gas Company, to obtain an appointment for the delegates to wait upon the directors of the company."

It was arranged that Mr. Slee should convene the meeting as a deputation as soon as the gas company made an appointment to receive them, and that the delegates should meet as soon as possible after the reply of the gas company to their request should be received.

On the motion of Mr. BISHOP, the following gentlemen were accepted as delegates—viz., from St. John's, Messrs. Daintree and Gutteridge; from Bermondsey, Messrs. Frean, Darnell, Hudson, and Brazil.

A vote of thanks was passed to the chairman for presiding and for granting the use of the Vestry-Hall for the meeting to be held in; as also to Mr. Slee for his valuable services.

The meeting then terminated.—*South London Journal.*

MR. QUICK'S REPORT TO THE SOUTHWARK AND VAUXHALL WATER COMPANY ON CONSTANT WATER SUPPLY.

GENTLEMEN,—Agreeably to your instructions I have again considered the question of the "constant," as contrasted with the "intermittent" supply of water, and the alterations in private houses which would be rendered necessary by the substitution of the former for the latter system, and I have the honour to submit to you the following report:—

The seven years which have elapsed since the passing of the Metropolis Water Act have afforded abundant evidence as to the working of the so-called "constant supply" system, as well in this as in foreign countries.

The result of the whole evidence, coming from different localities, and arising under a great variety of circumstances and conditions, is conclusive against the system. Wherever the experiment has been tried it has entailed the greatest inconveniences on both the companies supplying and on the consumers of water—and in no single instance, it is believed, has it succeeded in giving a really constant supply. By no precautions has it yet been found practicable to guard against a waste of water so great as to render impossible the keeping up a head of water during the whole of the 24 hours.

In the towns of Bristol, Croydon, Dover, Wolverhampton, Preston, Woolwich, Rugby, and others, where the works have been laid out with every provision to meet the requirements of constant supply, it is found that either from wilful or accidental waste, the system has proved more or less completely a failure, after entailing upon the ratepayers an enormous expenditure.

In America the "constant supply" has been introduced into the towns of Philadelphia, Boston, Cincinnati, Baltimore, Massachusetts, New York, and other places, but in every case the same results have followed; and in New York it is notorious that the celebrated "Croton Aqueduct" which was

calculated to bring water enough to supply twice the present number of inhabitants has proved totally inadequate to supply even the present population. Notwithstanding the most rigorous inspection and supervision, and the enforcement of fines, the waste is continually on the increase, and there is even a probability of the whole city being left without water.

At Boston, where the water-works supply a population of 155,000 inhabitants, and the daily consumption of water is 8,542,000 gallons, or 55 gallons to each individual (being more than double the quantity originally calculated, and more than 1,300,000 gallons beyond the supply estimated for a population of 250,000 persons), it was found that on several occasion the quantity had increased to 11,600,000—13,100,000—and 14,000,000 gallons, and the waste was so excessive that there was great danger of the city being left entirely without water.

A very recent instance in this country of an attempt to introduce the "constant supply" affords a strong illustration of the working of the system. The Kent Water Company has made repeated experiments to ascertain the daily consumption of water under constant pressure, both in ordinary eight-roomed houses laid on with the usual fittings and one water-closet, and also in houses laid on with every precaution to prevent waste by the introduction of small service-pipes, without cistern or waste-pipes or connexion with the water-closet, the latter being flushed with the waste water from the house.

The average consumption in eight-roomed houses with one water-closet and ordinary fittings amounted to 2000 gallons daily, and the average consumption in similar houses with every appliance to meet the requirements of the company, was 500 gallons daily. At this moment, as already observed, there is probably no city or town of any magnitude in the world where the constant supply is in efficient operation. There may possible be (although I am not aware of any such instance) some small places in which, by means of a rigorous police supervision, the system may be partially successful, but speaking generally, it has beyond doubt proved a failure, and been superseded by the only really "constant supply," *i. e.*, by having in every house a cistern of sufficient capacity to provide for the daily requirments of the inhabitants.

It has been mentioned that the introduction of the "constant supply" system must of necessity involve grave inconvenience to the consumers; it may be added that it would also entail upon them great expense.

By the Metropolis Water Act, persons seeking to have "constant supply" must conform to such regulations as the company, with the approbation of the Board of Trade, may find it necessary to lay down.

The following regulations involve the least changes which the introduction of "constant supply" would render necessary:—

1.—Every house must be provided with a proper cistern and approved ball-cock, with means of access, and no overflow or waste pipes can be allowed in any case whatever.
2.—Every house must be connected to the company's main by a separate service-pipe, laid on direct to the cistern. No draw-off taps or branches from the service-pipe can be allowed in any case.
3.—The supply to every water-closet must be regulated by means of a water waste-preventor of approved construction.
4.—All service-pipes must be of sufficient strength to bear the increased pressure consequent upon the alteration in the mode of supply, the weight not being less than 2 lbs. per foot, and be provided with a stop-cock, with means of access, as near to the company's main as practicable.
5.—The company's inspectors or water police must be instructed, under the provisions of the Metropolis Water Act, to see that the fittings, &c., are in proper order; to ascertain if there be any waste or misuse of the supply; and in such case, the parties must be summoned before a magistrate, and the fine provided by the Act imposed.

The foregoing alterations could not in the smaller houses occasion to the landlord or occupier a less outlay than from £5 to £10 each house, but they would be *absolutely necessary*. Even when combined with the constant visits of the water police, it is extremely doubtful whether they would afford a chance of giving the domestic supply, at the same time with the supply to brewers and other large consumers, upon the continuance and regularity of whose works the employment, and, consequently, the livelihood, of so many of the working classes depend. These precautions would be equally necessary to keep up the head of water in the mains in case of fire.

But, it may be asked, where is the necessity for a change so dangerous to the public and so onerous alike to the company and the consumers?

The water pumped daily into the district is equal to 210 gallons per house, or 30 gallons for each individual—a quantity more than two-fold greater than the highest sanitary authorities have declared to be necessary. With the most ordinary caution, therefore, every house may have more than an abundant supply of water, as no limit is placed by the company on the size of a cistern for domestic purposes, and the water is turned on for a sufficient time every day to give the amount of supply above mentioned.

It is not within my province to offer any suggestions on the financial part of this subject, but the additional expense which would be entailed on the company by the waste of water, on the one hand, and the number of inspectors they must appoint, on the other, would, I presume, compel the company to raise their rates in any district having the constant supply to the full extent of their parliamentary scale, involving an advance in most cases of from 5 to 10 and 15 per cent., and to decline permitting small houses to be farmed on an allowance of 20 per cent., as at present.

The company's district extends from the Commercial Dock, on the east, to Wimbledon and Roehampton, on the west; from the banks of the Thames, on the north, to Peckham, Camberwell, Dulwich, Brixton, Clapham, Wandsworth, and Putney, on the south and south-west. The variation of levels in these districts is from 2 feet below to 166 feet above Trinity high water mark. Some of these districts are so situated with respect to the low-lying districts between Rotherhithe and Putney, that before the constant supply could be introduced into them the whole of the inhabitants supplied in those localities must comply strictly with the above regulations.

I may further add, that when a fire occurs, the great object is to concentrate the whole pressure of water in the main or service in the street where the fire takes place. Under a system of intermittent supply, the pressure is constantly maintained in the trunk mains, and it is therefore only necessary to open the stop-cock to charge the service in any particular street to obtain an immediate supply of water at high pressure. Whereas, if all the street-services were left constantly open together, it would be necessary to shut them *all* off, if it were required to concentrate the pressure in any one service.

The practical difference, therefore, is, that under a system of "intermittent supply," it is only necessary, in case of fire, to open one or two stop-cocks, while, under the constant system it would be necessary to shut probably several hundred, according to the locality.

I am, gentlemen, your obedient servant,

April 21, 1865. (Signed) J. Quick, Engineer.

P.S.—It may be added, that since this report was drawn up, additional experience has only tended to confirm the conclusions it contains.

GAS LIGHTING IN RAILWAY AND OTHER CARRIAGES.

On Saturday, the 2nd inst., at the Ordinary Monthly Meeting of the London Association of Foremen Engineers—Mr. Joseph Newton, of H.M. Mint, in the chair—the president called upon Mr. William Dalziel to read his promised paper on "Gas Lighting in Railway and other Carriages."

Mr. Dalziel, after some preliminary remarks, proceeded to say that one of the greatest difficulties which had had to be encountered in lighting railway carriages with gas was that of want of sufficient space for carrying an adequate quantity for long journeys. One of the most successful operators in the work hitherto was Mr. Newall, of Lancashire, and his plans were in use on several railways, but he (Mr. Dalziel) believed for short journeys only. Mr. Newall's apparatus consisted of an india-rubber bag resembling somewhat the bellows of an accordion. This, when inflated, was distended to its full extent, and as the gas was consumed a corresponding collapse, caused by its own weight, occurred until the bag became empty. The gas reservoir, if he might so term it, in this case would be placed in any part of a train, and either above or below a carriage. Usually, however, it was deposited in a compartment of a break van, and when this arrangement was adopted service-pipes were carried along the roofs of the carriages, the connexions between the latter being effected by india-rubber tubing, fitted with union joints for the purpose of ready attachment and detachment. The service-pipes are furnished with brackets, the burners of which pass through the roofs of the carriages for the purpose of illumination.

The mode of charging the bags with gas was as follows:—In some convenient spot at the station a large receiver was placed. This was supplied with water from a height of about 30 ft., through a pipe and stop-valve. Another pipe and stop-valve introduced the gas into the receiver. There were two outlet-pipes, also furnished with stop-valves, one for water and the other for gas. The gas outlet-pipe was carried to the place for charging the bags, a hose-pipe serving to connect them with the receiver. Before filling the bags with gas it was necessary to get rid of the air within the receiver, so as to prevent the possibility of an explosion. This was done by opening simultaneously the water inlet and the gas outlet valves. When the receiver was charged with water the two valves named were closed, and the water inlet and gas outlet valves were opened. The vacuum left by the receding water was thus filled with gas, in accordance with a natural law. When the water was completely removed, both valves were closed, and the connexion made between the gas-bags and the receiver. Next, the water supply and the gas discharge valves were opened. The pressure of water thus forced the gas into the bags. Once the latter were filled with gas, it was essential to cut off all communication with head of water, or the bursting of the bags from over-pressure would assuredly follow. These arrangements completed, the carriages were ready for lighting. By this plan every cubic foot of gas required a cubic foot of space, the column of water employed not being for the purpose of compression, but for facilitating the charging of the bags as described. The bulk of such gasholders, it would be readily seen, formed a practical objection to their use.

Supposing, for example, a train of carriages were going from London to Glasgow, it would require sixty lights, and each light would consume 3 feet of gas per hour. In order to supply this quantity, on the india-rubber bag principle, the agency of two and a half vans, each measuring 20 feet by 7 feet, and 6 feet in height, giving a space equal to 2340 cubic feet, or one-eighth of the entire train, would be necessary.

The bags were also liable to be damaged at their corners from their constantly recurring expansion and contraction. The illuminating power of the gas, too, was diminished when water was used for charging the bags, by the action of the law of absorption. Another objection consisted in the fact that if the bags were allowed to remain charged for a number of days, the principle of gas diffusion would come into operation. Air would take the place of gas to a considerable extent by passing through the minute pores or cells of the india-rubber, and a highly explosive and dangerous compound would be the result. Several other schemes besides that of Mr. Newall had been attempted, and were patented. None of them had been attended with much success, and it was not—the reader of the present paper said—needful further to refer to them. He would, therefore, mention that a high-pressure portable gas company had once existed in London, but that it failed from inability to ensure a uniform light, and then pass on to his own (Mr. Dalziel's) plan for carriage lighting. Self-acting appliances were the great desiderata for the successful development of the railway system, and in what he had done towards lighting railway carriages with gas he had kept that fact constantly in view. The South-Eastern Railway Company were at present testing his invention on their line. The problem he had sought to solve was that of obtaining a uniformly steady light from a high-pressure gasholder, and that with a minimum amount of trouble and attention on the part of those who would have the direct control of the apparatus. The gasholder in use on the railway in question had a cubical area of 8¼ feet; this, when charged up to a pressure of 135 pounds on the square inch, supplied two No. 3 burners for a period of sixteen hours, and the latter gave out a uniform and perfectly unvarying amount of luminosity. In order to effect this, he had placed two wrought-iron tubes of 7½-inch bore, 14 feet 6 inches in length, and the ends of which were welded upon the bottom of one of the carriages. The tubes were connected together by means of a small pipe. To these high-pressure gasholders were applied inlet and outlet pipes. Connected to the outlet-pipe was a regulator. This consisted of a common gasholder, working in water, forming a hydraulic joint. The regulating holder is fitted with an inlet and an outlet pipe, the last-named being carried to the burners on the carriage. The outlet-pipe of the high-pressure holder is connected with the inlet-pipe of the regulator. Fixed between the inlet of the regulator and the outlet of the high-pressure holder is a slide-valve worked by a lever. The port of the slide-valve is of a V-shape, the lever being attached to the regulating-holder by means of connecting-rods. When, therefore, the regulating holder rises it depresses the valve and closes the port; on the contrary, when it descends it opens the port.

When the high-pressure holder was charged with gas the latter passed through it and into the regulating holder, causing the gradual closing of the port. When the port was closed the charging might be continued until the pressure required was attained; afterwards all would be ready for lighting.

Allowing that this has been accomplished, and that the consumption of gas is going on, the action of the apparatus would be as follows:—The regulating holder gradually descends, opens the port, and admits a further supply from the high-pressure holder. Thus it continues to act and react, its movements being governed entirely by the passage of the gas and demanding no attention until the time arrives for recharging the high-pressure holder, which is a simple mechanical operation performed indeed by a force-pump working by a steam-engine.

By this arrangement, Mr. Dalziel stated, great economy would result. Each carriage would have its own independent reservoir of compressed gas, sufficient, if needed, to supply two burners for sixty hours, and the whole occupying comparatively very little space. The apparatus would be invisible

to the passengers, and so simple that it could scarcely be deranged unless by some severe accident. Iron vessels were proof against the operation of the laws regulating the diffusion of gases, which Professor Graham, and Mr. Ansell, of the Mint, had so clearly illustrated, and therefore might remain charged for months, if necessary, without danger. Mr. Dalziel stated that it did not become him to say more upon the merits of his own invention, but that he was prepared to answer any questions in reference to it which his brother members might think proper to put. He then resumed his seat.

A discussion followed, in which Messrs. Sanson, Ives, Briggs, Edmonds, Usher, Lax, and the president shared; and Mr. Dalziel having replied satisfactorily to several queries, and moved a vote of thanks, the proceedings, which throughout were of an interesting character, came to an end.

THE COAL AND IRON TRADES OF GREAT BRITAIN.*

[From the *Colliery Guardian.*]

Mr. Hunt's "Mineral Returns" for the year 1864 are now before the public, and we proceed to analyze the contents of the volume, so far as they are specially interesting to those connected with the coal and iron trades.

COAL.

The total number of collieries in the United Kingdom is 3268, being an increase of 108 as compared with the preceding year. The quantity of coal raised in 1864 is stated to be 92,787,873 tons, which is an advance upon the quantity last year of nearly 5½ million tons. In 1861 Mr. Hunt estimated the quantity used and sold at 83,635,214 tons; in 1862, in consequence of the interruption to which some branches of our manufactures had been subjected, it fell to 81,638,338 tons; in 1863 it again rose to 86,292,215 tons; and last year it reached 92,787,873 tons. The number of collieries and the quantity of coal raised during the eleven years ending December, 1864, are as follows:—

Year.	No. of Collieries.	Tons of Coal raised.
1854	2397	64,661,401
1855	2613	64,453,079
1856	2829	66,645,450
1857	2867	65,394,707
1858	2958	65,008,549
1859	2949	71,979,765
1860	3009	84,042,698
1861	3052	83,635,214
1862	3088	81,638,338
1863	3160	86,292,215
1864	3268	92,787,873

The number of collieries and the quantity of coal raised in each of the several districts are given as follows:—

District.	No. of Collieries.	Tons of Coal raised.
Durham and Northumberland	289	23,248,367
Cumberland	30	1,380,795
Yorkshire	422	8,809,600
Derbyshire	154	4,470,750
Nottinghamshire	21	796,700
Leicestershire	10	890,500
Warwickshire	16	754,000
Staffordshire and Worcestershire	640	11,459,851
Lancashire	379	11,530,000
Cheshire	39	822,750
Shropshire	66	1,150,000
Gloucestershire, Somersetshire, and Devonshire	133	1,950,000
Monmouthshire	85	4,028,500
South Wales	333	6,948,000
North Wales	81	1,987,060
Scotland	497	12,400,000
Ireland	73	125,000
Total produce of the United Kingdom	3268	92,787,873

The following table shows the increase in the number of collieries since 1861:—

Counties.	1861.	1862.	1863.	1864.
England—				
Durham and Northumberland	271	279	312	389
Cumberland	28	28	32	30
Cheshire	35	39	39	39
Lancashire	373	379	379	379
Yorkshire	397	418	415	422
Derbyshire	158	155	154	154
Leicestershire	11	10	10	10
Warwickshire	16	16	17	16
Nottinghamshire	22	21	20	21
North Staffordshire	128	114	117	117
South Staffordsh. and Worcestershire	452	457	465	523
Shropshire	66	65	66	66
Gloucestershire and Somersetshire	111	118	119	131
Devonshire	2	2	2	2
Wales—				
Pembrokeshire	21	21	21	20
Carmarthenshire	88	87	92	80
Glamorganshire	294	215	233	216
do. and Monmouthshire		93	90	96
Flintshire	38	41	41	41
Denbighshire	35	31	35	35
Anglesea	5	5	5	5
Scotland—				
Lanarkshire	169	184	190	202
Ayrshire	90	91	96	101
Fifeshire	44	46	48	49
Clackmannan	9	8	8	8
Haddingtonshire	12	13	14	14
Edinburghshire	15	17	16	16
Linlithgowshire	17	17	28	20
Stirlingshire	39	41	46	48
Dumbartonshire	14	13	16	17
Other counties	15	18	13	22
Ireland	46	46	40	73
Total	3025	3088	3180	3268

* *Mineral Statistics of the United Kingdom of Great Britain and Ireland for the Year* 1864. By Robert Hunt, F.R.S., Keeper of Mining Records. London: Longman, Green, Longman, and Roberts.

The gross produce of the northern coal-field, including Northumberland and Durham, and comprising 319 collieries, is 23,284,369 tons, which has been thus distributed:—

	Tons.
Coals exported to foreign countries	4,104,484
Coke do., 224,180 tons, equivalent to coals	448,362
Coals sent coastwise	6,188,026
Coke do., 23,016 tons, equivalent to coals	46,032
The quantity of coals carried by the North-Eastern system of railways for land sale, local consumption, shipment and railway use	3,926,038
Coke do. do., 1,818,462½ tons, equivalent to coals	3,636,925
Coals and coke used in iron-works (estimated)	1,354,500
Colliery consumption (estimated)	1,850,000
Immediate local consumption for general purposes and manufactures	1,730,000
Total sold or used for Durham and Northumberland	23,284,367

YORKSHIRE possesses 420 collieries, the production of which during the year 1864 was as follows:—

No. of Collieries.		Coals produced. Tons.
42	Barnsley	1,435,000
52	Bradford	1,425,000
33	Halifax	430,500
39	Huddersfield	317,600
102	Leeds	2,120,000
4	Normanton	
23	Rotherham	461,000
28	Sheffield	975,500
45	Wakefield	1,125,000
6	Bingley	520,000
25	Dewsbury	
8	Holmfirth	
1	Keighley	
6	Penistone	
5	Pontefract	
3	Saddleworth and Settle	
Total 422	The quantity of coals produced in Yorkshire	8,809,600

LANCASHIRE.—The number of collieries in the north and east or Manchester division is 276
The number of collieries in the western district is 103
Total 379

The coals raised and sold in 1864 were as follows:—

	Tons.
The north and east division, including cannel coal	5,900,000
The western division	5,630,000
Total produce	11,530,000

CHESHIRE contains 39 collieries, and their produce in 1864 was 822,750 tons

CUMBERLAND contains 30 collieries, and the quantity of coal produced and shipped for 1864 was as follows:—

	Tons.
Shipped from Maryport	443,672
do. Workington	139,193
do. Whitehaven	145,880
Total	727,745
Coal used at iron furnaces	395,550
do. collieries and iron mines	
do. for local consumption at manufactories and in principal towns	257,500
Total produce for Cumberland in 1863	1,380,795

DERBYSHIRE, NOTTINGHAMSHIRE, LEICESTERSHIRE, and WARWICKSHIRE, contain 201 collieries, and these, during the year 1864, produced the following quantities of coal:—

No. of Collieries.		Coals produced. Tons.
78	Chesterfield	4,470,750
31	Afreton	
10	Ripley	
1	Belper	
5	Buxton and Glossop	
6	Stockport	
14	Ilkeston	
9	Burton-on-Trent	
21	Nottinghamshire	796,700
16	Warwickshire	754,000
10	Leicestershire	890,500
Total 201	The quantity of coals produced in the above counties	6,911,950

STAFFORDSHIRE and WORCESTERSHIRE have 640 collieries, of which 117 are situated in North Staffordshire, and 523 in South Staffordshire and Worcestershire.

The produce of the North Staffordshire collieries in 1864 was as follows:—

	Tons.
Coals used at iron-works	1,254,000
do. in the potteries, and for ordinary local consumption	950,000
do. colliery consumption	17,500
Sent out of district and sundries	975,000
	3,196,500

In reference to South Staffordshire and Worcestershire, Mr. Hunt says:—"The total quantity of coal produced in 1864 from these collieries, and sold or used, was 8,263,351 tons. Returns have been received from the most important collieries to the extent of 4,465,000 tons; the other collieries have been carefully computed. For the purpose of determining the correctness of the above computation, the following is an estimate, carefully made after the closest inquiry, of the way in which this coal was consumed."

	Ton.	
Coal used in the production of pig iron, at 2½ tons of coal to each ton of pig		1,472,445
do. in the manufacture of 911,000 tons of bar-iron, at 3½ tons for all purposes		3,188,500
Birmingham received and used		671,616
All other districts in South Stafford, at one ton of coal per annum per head		576,920
Worcestershire		136,632
Warwickshire		71,249
Railways carried out of district:—		
London and North-Western	389,174	390,555
Great Western	11,381	
Engine coal and slack, at 30 tons a week to each 40-horse power of engines at collieries		715,400
"Rodney fires" and miscellaneous colliery consumption		250,000
"Allowance coal," at 40 tons for each 50 men per month		249,600
Brick-making: 100,000,000 the annual make, at 10 cwt. of coal per 1000 bricks		50,000
Glass and sundry manufactures (Birmingham not included)		850,000
		8,622,917
Coal taken into and used in South Staffordshire, to be deducted from the above:—		
The Great Western Railway carried from North Wales, South Wales, and Shropshire	121,080	
The Midland Railway, from the Midland Coal-field	113,486	
The London and North-Western, from Lancashire (estimated)	125,000	
		359,566
Total production of South Staffordshire		8,263,351
" " North Staffordshire		3,196,500
Total of county		11,459,851

Mr. Hunt intimates that in comparing the above statement with those of former years it will be necessary to make corrections, all the returns being too small. This has arisen from having taken the "boat load" as being 20 tons. The best explanation of the difficulty will be given in the following paragraph, from a paper read at a conference of mine owners and agents, by Rupert Kettle, Esq., Vice-President of the Dudley and Midland Geological Society, &c.: "We have in our colliery district three different weights, each called and commonly recognized as a ton. First, the statutable ton, that is, the avoirdupoise weight of 2240 lbs. Next, we have the 'long hundred,' or long weight, as we commonly understand it, that is, 120 lbs. to the hundredweight, instead of 112 lbs., giving 2400 lbs. to the ton; and then, thirdly, we have the boat load of 24 'long hundreds,' or 2880 lbs. to the ton; and, lastly, there is a measure acted upon, I am sorry to say, for business purposes, called 'a boat load.' I should very much like some one to tell me any rule by which I can ascertain the exact weight, according to the law standard, of the whole or an aliquot part of a 'boat load of coals.' I know a boat load is twenty tons, and the furthest to which I can carry the weight is twenty tons 'lease weight,' that is 57,600 lbs., or 25 tons 13 cwt. 2 qrs. and 16 lbs. weight, and yet I am told that sometimes a 'boat load of coals' will, what is called, 'weigh out' 30 hundredweight to the ton."

Shropshire.—Number of collieries, 66; produce, 1,150,000 tons.

South Wales.—The number of collieries in South Wales is 316, and their produce in 1864 was as follows:—

No. of Collieries.		Produce.
216	Glamorganshire	6,948,000
20	Pembrokeshire	
80	Carmarthenshire	
316		

The following is a detailed statement of the coal raised in the South Wales district during the year ended 1864:—

	Tons.
Llanelly, Carmarthenshire. Partly shipped at Llanelly and partly used in large iron-works	486,245
Neath, Glamorganshire. Shipped at Swansea, Neath, and Briton Ferry, and used for iron and copper works	928,275
Swansea, Glamorganshire. Partly shipped, but bulk used for iron and copper works	631,567
Briton Ferry, Glamorganshire. Shipped (*large*) here, *small* used for iron and copper works	30,629
Pontypridd. Rhondda Valley, Glamorganshire. Nearly all shipped at Cardiff	753,699
Merthyr, Glamorganshire. Some shipped at Swansea and Cardiff, but principally used at large iron-works	1,216,467
Navigation near Aberdare, Glamorganshire, but not in the parish of Aberdare. Shipped at Cardiff and Swansea	236,528
Pembrokeshire. Used principally in the surrounding districts for household purposes	145,797
Gellygaer, near Merthyr. All shipped at Cardiff and Newport, Monmouthshire	57,821
Bridgend, Glamorganshire. A little shipped at Cardiff and Swansea, but principally used for iron purposes	412,503
Raised in the parish of Aberdare. Shipped at Cardiff and Swansea, and used at large iron-works	2,048,472
Total	6,948,000

North Wales.—The number of collieries in North Wales is 81, and their produce in 1864 was as follows:—

No. of Collieries.		Produce.
41	Flintshire	590,500
5	Anglesea	15,000
35	Denbighshire	1,381,560
81	Total (of which 120,000 tons were cannel coal)	1,987,060

Gloucestershire, Somersetshire, and Devonshire, have 133 collieries, the produce of which, arranged in the several districts, was as follows:—

No. of Collieries.		Tons.
94	Gloucestershire	1,950,000
37	Somersetshire	
2	Devonshire	

In Monmouthshire, the number of collieries is 102, including a few on the edge of Glamorganshire, and the produce 4,028,500 tons.

Scotland.—The number of collieries in Scotland is as follows:—

Western district		223
Eastern district		274
Total		497

The produce of these collieries in the year 1864 was—

Western district	6,150,000
Eastern district	6,250,000
Total	12,400,000

Ireland.—The number of collieries in Ireland is 73. These produced—of anthracite and small coal, 70,000 tons; bituminous coal, 55,000 tons: total, 125,000.

The quantities of coal brought by railway and by sea within the London district in 1864, as compared with 1863, were as follow:—

	1863. Tons.	cwts.	1864. Tons.	cwts.
By railway and canal—				
London and North-Western Railway	759,763	8	961,697	1
Great Northern Railway	550,908	0	803,169	10
Great Eastern do.	160,323	3	197,853	6
Great Western do.	110,440	0	191,931	0
Midland do.	165,984	13	137,340	7
South-Western do.	19,900	7	20,349	5
South-Eastern do.	—		17,716	14
Chatham, Dover, and Mid-Kent do.	7,569	13	11,744	6
Tilbury and Southend do.	598	0	639	0
Grand Junction Canal do.	9,226	0	8,902	10
Total	1,784,713	4	2,351,342	19
By sea—				
Newcastle	1,201,622	0	1,286,352	0
Seaham	227,418	0	149,841	0
Sunderland	988,100	0	903,721	0
Middlesbro'	72,430	0	77,640	0
Hartlepool and West Hartlepool	621,379	0	509,692	0
Blyth	17,175	0	9,836	0
Scotland	22,458	0	17,004	0
Wales	104,513	0	92,467	0
Yorkshire	38,115	0	26,640	0
Liverpool	—		—	
Duff	2,001	0	307	0
Small coal	23,058	0	30,913	0
Coke	16,630	0	—	
Culm	266	0	—	
Cinders	—		12,290	0
Total	3,335,174	0	3,116,703	0
Total by railways and canal	1,784,713	4	2,351,342	19
Total	5,119,887	4	5,468,045	19

IRON.

Iron Ore Produce.

The following summary is as closely correct as it is possible to obtain it, and, together with the details which follow, represent very closely the value of the iron ores raised in the United Kingdom. It must be understood, however, that this summary gives the total returns received. It has not been possible in all cases to separate the calcined from the uncalcined ore. Could this have been done, the quantity of raw ore would have been somewhat increased.

	Quantities. Tons.	cwts.	Value.		
Cornwall	34,210	6	£12,863	10	9
Devonshire	11,068	0	5,271	10	9
Somersetshire	52,925	4	26,868	12	0
Gloucestershire	141,843	0	63,830	8	0
Wiltshire	79,918	5	31,967	2	0
Hampshire	5,100	0	2,335	0	0
Oxfordshire	6,666	0	2,666	8	0
Northamptonshire, &c.	335,787	0	84,761	5	0
Lincolnshire	74,619	7	17,890	0	0
Shropshire	254,590	0	63,209	0	0
Warwickshire	15,750	0	3,937	10	0
Staffordshire, North	582,750	0	174,478	10	0
do. South	948,500	0	280,450	0	0
Derbyshire	325,600	0	81,400	0	0
Yorkshire, North Riding	2,401,890	14	698,242	19	0
do. West Riding	555,000	0	113,750	0	0
Lancashire	691,421	15	345,710	6	6
Cumberland	863,667	0	529,690	5	0
Northumberland and Durham	175,500	0	52,650	0	0
Wales, North	29,127	0	9,835	12	6
do. South	468,365	5	185,360	17	1
Scotland	1,950,000	0	650,650	0	0
Ireland	60,602	0	20,326	0	0
Total	10,064,890	16	£3,367,144	16	1

Pig Iron Manufacture.

The total quantity of iron ore raised in the United Kingdom, as shown in the preceding returns, amounted to 10,064,890 tons—value £3,367,144.

The number of furnaces in blast was 612¾. These produced of pig iron in England, 2,620,472; Wales, 988,729; Scotland, 1,158,750: total, 4,767,951.

This quantity, estimated at the mean average cost of production, would have the value of £11,919,877.

Summary of Pig Iron Produce in 1864.

	No. of Iron-Works.	No. of Furnaces built.	No. of Furnaces in Blast.	Tons of Pig Iron produced.
England—				
Northumberland	8	17	7	55,467
Durham	19	62	42	466,980
Yorkshire, North Riding	13	47	41	409,106
do. West Riding	12	35	25	112,098
Derbyshire	17	43	31	174,743
Lancashire	4	15	13½	195,460
Carried forward	73	219	159½	1,413,854

Brought forward . .	73	219	159½	1,413,854
Cumberland	4	16	11	141,033
Shropshire	12	30	22¾	130,666
North Staffordshire	9	35	25	217,996
South do. and Worcestershire .	68	172	104½	628,793
Northamptonshire	2	4	3	22,823
Lincolnshire	3	11	6	
Gloucestershire	4	9	6	
Wiltshire	1	3	3	65,312
Somersetshire	2	2	1	
Total	178	502	340¾	2,620,472
North Wales—				
Denbighshire	9	14	8	51,108
South Wales—				
Anthracite district . . .	8	29	9	26,335
Glamorganshire, *Bituminous* .	17	82	64	461,822
Brecknockshire do. .	4	17	10	34,260
Monmouthshire do. .	15	69	50	415,174
Total	52	211	141	988,729
Scotland—				
Ayrshire	8	43	34	
Lanarkshire	14	101	81	
Fifeshire	3	12	6	
Linlithgowshire	1	4	3	
Stirlingshire	2	7	6	
Clackmannanshire	1	1	0	
Haddingtonshire	1	1	1	
Argyleshire	1	1	0	
Total	31	170	131	1,158,750

THE STATE OF THE THAMES.—A meeting of the inhabitants of Twickenham and its neighbourhood was held on the 12th inst., at the Parochial School-Room, Twickenham, for the purpose of considering what measures should be taken to remedy the present unsatisfactory condition of the Thames. The chair was taken by the Rev. G. G. Glossop, who was supported by Mr. F. H. N. Glossop, Mr. H. G. Bohn, Mr. Chillingworth, and Lord Ranelagh, and about forty or fifty other gentlemen were also present upon the occasion. After considerable discussion on the very bad condition of the river, the following resolutions were agreed to:—"That, in the opinion of the present meeting, the state of the river Thames in this locality is prejudicial to the health of the inhabitants, in consequence of the dangerous exhalations which arise from the extensive banks of mud exposed to the action of the sun for many hours daily; and that steps be forthwith taken to call upon the official conservators of the river to remedy the evil." "That, in the opinion of this meeting, a lock and weir situated between Isleworth and Strand-on-the-Green would be the most efficacious remedy for the evil complained of." A resolution was also adopted for the appointment of a committee to co-operate with the inhabitants of neighbouring towns on the banks of the Thames, with the view of adopting such measures as may be deemed advisable, this committee to consist of Lord John Chichester, Lord Willoughby D'Eresby, Mr. Chichester Fortescue, M.P., the Duke d'Aumale, and other noblemen and gentlemen, with power to add to their number.

GAS LIGHTING AT ST. THOMAS'S.—Advices by the West India mail state that the British brig *Her Majesty* arrived on the 18th ult., with the remainder of the mains required for the completion of the gas-works. The laying down of the pipes was progressing very rapidly, and it was confidently expected that the town will be lighted up with gas by the end of September.

THE OTTOMAN GAS COMPANY, LIMITED.—At the meeting of the shareholders of this company on Monday, the 11th instant, the directors reported that the sales of gas, coke, and tar, for the past half year, amounted to the sum of £1525. 7s. 7d., and that, after deducting the wages, salaries, rent, &c., amounting to £1226. 0s. 6d, there remained a profit of £299. 7s. 1d. Although the general account showed a loss, the directors state that on the whole the progress may be considered satisfactory, and notwithstanding the

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	£5 intr.	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited).	5 0 0	£5 intr.	5⅜ to 5⅝
10000	5	Do., second issue	4 0 0	£5 intr.	4 5 0
10000	5	Do., third issue .	2 0 0	£5 intr.	2 7 6
5000	20	Brit. Provincial L.	20 0 0	7 10 0	30 to 30½
8200	20	Do., new . . . . (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27¼
12000	50	*Chartered*	50 0 0	10 0 0	75 0 0
6000	50	Do.	30 0 0	10 0 0	45 0 0
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30¼ to 30⅜
10000	10	Do., B shares	10 0 0	4 0 0	7⅛
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L)	5 0 0	£7 intr.	3¼ to 3¾
		Colonial & General			
17490	25	*Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	10 2 6
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
5000	10	Do., preference .	10 0 0	6 0 0	12¼ to 13
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13 10 0
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6⅞ to 6¾
20000	10	*Great Central Gas Consumers* . .	10 0 0	10 0 0	16¼ to 16⅝
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	82 to 83
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian .	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Harlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	93 to 93¼
3000	40	*Independent* . . .	40 0 0	10 0 0	65 to 67
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6886	50	*London*	50 0 0	10 0 0	79 10 0
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sk		6 0 0	
11828		Do., 2nd pref. sk		5 0 0	
1500	5	Malta & Medit. (L.)	5 0 0	2 10 0	
30000	5	Oriental, Calcutta	5 0 0	8 0 0	5 17 6
30000	5	Do., new shares.	0 10 0	8 0 0	0 12 6
10000	5	Ottoman (Limited)	5 0 0		3⅞ to 4¼
10000	10	Parà (Limited) . .	10 0 0	£5 intr.	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 10 0
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
10000	10	*Ratcliff*	20 0 0	10 0 0	35 to 37
5000	20	Rio de Janeiro (L)	20 0 0		20 to 20½
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference .	5 0 0	7 10 0	
		Shanghai			
1000	10	*Victoria Docks* . .			16¾ to 17
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	
10000	10	Do., B shares.	5 0 0	10 0 0	8 10 0
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 15 3	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¾ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lumbton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s. 9d
Cork	9s. 6d. to 10 0
Dover, Folkestone, and Ramsgate	6 9
Dublin	10s. 0d. to 10 6
Exeter Quay	8 6
Ipswich	5 9
London (from Leith)	8 6
London (Pool)	7s. to 7 3
Lowestoft and Yarmouth	4 9
Portsmouth and Southampton	8 9
Plymouth	8 3
Shoreham	7 6
Whitstable	6 9
Weymouth	8 3

Foreign.—Per Keel:—

Barcelona	£24 10
Bordeaux	£15. to 15 10
Boulogne and Calais	£8 to 8 5
Cadiz	17 10
Copenhagen	£9. to 8 10
Genoa	£22. 15s. to 23 0
Hamburg	£9. 10s to 9 15
Havre de Grace	10 5
Leghorn	22 10
Lisbon	16 10
Rotterdam	£9. to 9 2
Stettin	10 10
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to	£2 15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 6
Ingham's ditto (at Wortley), p. 1000..	2 15 0
Fire-clay Retorts, p. ft. run, 8s. 6d. to	0 7 0
Tough Cake Copper, p. ton	85 0 0
English Pig Lead, p. ton	20 10 0
Welsh Bar Iron (in London), p. ton ..	7 15 0
Foreign Spelter, p. ton	22 5 0
English Block Tin, p. ton	93 0 0
Banca, p. ton	93 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

consumption of gas has not been such as would be expected in a similarly populous town in this country, yet a considerable improvement may be reasonably expected in the course of the next few months. Arrangements had been made for a proper monthly inspection of the accounts at Smyrna, at a moderate cost. A main has been laid to the Jardin de Smyrna, a public place of amusement resorted to by thousands, and numerous applications have been made to extend the mains to the Turkish quarter of the town, also a main of five miles to Bournebat, the residence of the wealthy inhabitants. The manager has been instructed to canvass these localities to ascertain what support, both public and private, will be given to the company. The amount received on debentures is £10,250, and as a further sum of £3000 is required, it is hoped that those shareholders who have not yet assisted the undertaking will do so at the earliest opportunity. Early in July the cholera, unfortunately, made its appearance in Smyrna, and gradually increased to the 10th of August, creating the greatest confusion, in fact, the town was in the utmost disorganization; all that could do so left—the cafés and shops closed, and all business has been at a stand-still. It is gratifying to say that by the latest accounts the malady is gradually subsiding, and it is hoped that business will shortly assume its general activity.

GALVANIZED IRON WATER-TANKS.—The effect of zinc, used in galvanizing iron, and also its bearing with reference to health, in the case of water-tanks, &c., has been recently examined by M. Roux, and the results of his investigation have been communicated to the Academy of Sciences. His object was an inquiry into the apparatus used on board the vessels belonging to the French navy, for the preservation of fresh water. But the subject was one which was intimately connected with the use of galvanized iron for domestic and other purposes. His experiments were made along with M. Ancousteaux, a naval engineer, by direction of the Vice-Admiral Prefect of the Marine for the Fourth Arrondissement. They established the fact that the zinc of galvanized iron is perceptibly attacked when water is present: the effect being very feeble with distilled water, which contains only a small quantity of atmospheric air and carbonic acid gas; somewhat stronger when the carbonic acid is evolved, by decomposition of the earthy carbonates; and at a maximum intensity with river water, containing a notable amount of atmospheric air and common salt. The quantity of oxide and carbonate of zinc produced with the latter is such as to render the water unfit for domestic purposes, and to be productive of mischievous compounds when acted upon by the acids found in the stomach—the acetate being astringent, the chloride a powerful caustic, and the nitrate an antiseptic of great energy. Even if the zinc itself were harmless, the lead, copper, and arsenic found associated with it in commerce would be productive of highly injurious effects. The Minister of the French Marine has, in consequence of the results obtained by M. Roux, forbidden the use of galvanized water-tanks in the navy. The question then presented itself of the effect of water on iron, or on tinned iron used for similar purposes. Iron tanks were found to be more energetically attacked by distilled and river water, than by that obtained from wells. The distilled water used in the experiments contained carbonic acid in considerable quantity, the river water various salts, and the oxide of iron was found to such an extent as to render the water turbid. Such a result gave rise to the suggestion that the outside of the tank should be galvanized, and the interior tinned: a mode of proceeding which had been shown to be very effective in preventing the formation of rust of iron. The use of minium for painting the exterior of the tanks, as frequently practised, was considered very objectionable. The fine and poisonous powder produced from it by friction is calculated to give rise to a real danger to human life. On the whole it appears to have been established that coating the outside with zinc, and the interior with tin, is calculated to preserve the tank very effectually, and is attended with no injury whatever to health.—*Scientific Review.*

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

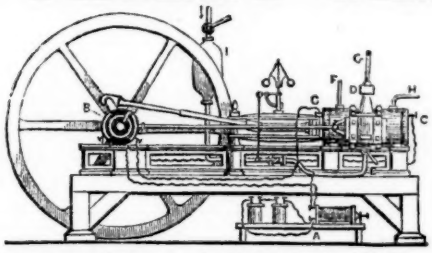
CLASSES X. & XXXI.

" George Glover and Co., per centage of error on the number tested, 2·116.
Thomas Glover ,, ,, ,, 2·812.
Croll, Rait, and Co. ,, ,, ,, 5·540.
Thomas Fletcher ,, ,, ,, 15·121.
Joseph Boulton ,, ,, ,, 25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

LENOIR'S PATENT GAS-ENGINE.

PUBLIC EXHIBITION,



From 11 to 1 AND 3 to 5 Daily.

40, CRANBOURNE STREET, LEICESTER SQUARE, LONDON

Manager and Secretary (pro tem.) MR. C. W. WOOD.

MANUFACTURERS, READING IRON-WORKS COMPANY (late BARRETT, EXALL, and ANDREWES).

Consumption of Gas not more than 70 feet per horse-power per hour of ACTUAL *work.*

The Gas-Engine is elegant in appearance, in construction simple; there is no boiler, generator, or accumulation of power, so that there is no danger. It is very clean and free from heat, smoke, dust, dirt, or noise. Its power is either constant or intermittent, and its cost only co-existent with its working. No skilled engineer is required. It can be instantly started, and as quickly stopped. Being light in weight, it can be worked in any apartment, or on any floor, and where steam-power would be totally inadmissible. With the leading Fire Insurance Companies it does not entail any charge for extra risk. The price of the Engines, including the necessary apparatus, is as under—½ horse-power, £65; 1 horse-power, £85; 2 horse-power, £110; 3 horse-power, £135. The usual terms to the Trade, &c.

THE Advertiser is anxious for an Engagement as MANAGER of a GAS-WORK. He has had many years experience in the manufacturing and distribution of gas, and also ten years practical experience in the same in all its branches, which can be shown by former testimonials, and also by his present employers, of whose works he has had the whole management for the last five years.

Address, B. P., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

THE Directors of the Burslem and Tunstall Gas Company require the services of a SECRETARY and MANAGER.

A good house, with coal, light, &c., is provided on the works. The salary is £100 per annum, with a per centage upon the annual profits; particulars of which may be had by writing to R. H. HAYWOOD, Esq., Chairman to the Company, to whom applications for the appointment must be sent in not later than Monday, the 25th of September next.

Longport, Sept. 2, 1865.

GAS-FITTERS.

WANTED, several experienced, steady MEN, to execute internal work.

Apply, with references, &c., to Mr. A. C. FRASER, Gas Engineer, LOUGHBOROUGH.

TO GAS COMPANIES.

WANTED, by the Advertiser, a situation as MANAGER of a country Gas-Work, or as FOREMAN under the manager of a large Gas-Work. Has had great experience connected with the manufacture of gas, the best mode of retort-setting in benches according to the size of the works; the laying of mains and services, indexing meters, and keeping carbonizing and office accounts; and has had considerable practice in the manufacture of sulphate of ammonia, now being so profitable.

Satisfactory testimonials and security.

Address, M. M., 9, Southampton Place, Gloucester Road North, LONDON.

TO DIRECTORS OF SMALL GAS-WORKS.

WANTED, to Hire on Lease, a GAS-WORK in Norfolk or Suffolk.

Apply to TELATA, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS APPARATUS FITTERS, ERECTORS, AND MAIN-LAYERS.

WANTED, several Men, both for England and abroad.

GEO. BOWER, St. Neots, HUNTS.

TO BE SOLD, the Patterns for cast- iron Cases for Gas-Meters, 4, 5, and 6 ft. diameter, and 8 ft. square, of elegant design.

Apply to Mr. COCHRANE, Harburn, by EDINBURGH.

TO BE SOLD, a Set of 4 Cast-iron DRY-LIME PURIFIERS, each 7 ft. 3 in. by 6 ft. 3 in., and 3 ft. 9 in. deep, with complete hydraulic centre valve, and revolving lifting-crane for the covers. Three tiers of cast perforated shelves in each, and 8-in. connexions.

The above purifiers are in good condition, and sold in consequence of larger having been substituted.

The Company have also for sale at a low price, in very good condition, a 3-horse TABLE STEAM-ENGINE.

The whole may be inspected and particulars known on application to Mr. GIFFORD, Gas Company's Office, CAMBRIDGE.

July, 1865.

IMPORTANT TO GAS COMPANIES AND DEALERS IN BURNING FLUIDS.

THE Commissioners for the Munici- pality of the City of Cape Town, Cape of Good Hope, have resolved to call for TENDERS both in the colony and in England, for Lighting the Streets of the City with either Gas or Paraffin, Kerosene, or other approved Oil.

The contract to be for seven years or such longer period as may be agreed on between the contracting parties; and the contractor is to furnish and keep in repair the lamps and lamp-posts.

The tenders to be sent to the Municipality not later than by the mail to the Cape of the 9th of December, 1865.

For particulars apply to the agents of the Municipality, SINCLAIR HAMILTON and Co., 17, St. Helen's Place, BISHOPSGATE STREET.

SURREY CONSUMERS GAS COMPANY.

NOTICE is hereby given, that the HALF-YEARLY ORDINARY GENERAL MEETING of the SHAREHOLDERS of this Company will be held at the London Tavern, Bishopsgate Street, on THURSDAY, the 12th day of October next, at Three o'clock in the afternoon precisely, to receive the Directors Report for the half year ending the 30th of June, last, and to declare a Dividend for the same period.

The Books for the Transfer of Shares will be closed on Saturday, the 30th of September, until the day of the Meeting.

W. P. BODDY, Secretary.

Rotherhithe, Aug. 26, 1865.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of the SHAREHOLDERS of this Company will be held at the Albion, Aldersgate Street, London, on THURSDAY, the 28th inst., to receive the Report of the Directors and Balance-Sheet confirmed by the Auditors, to declare a Dividend, and for general business.

The Chair will be taken at Three o'clock precisely.

By order of the Board,

MAGNUS OHREN, Secretary.

Offices, Lower Sydenham, S.E., Sept. 8, 1865.

PHŒNIX GASLIGHT and COKE COMPANY.

NOTICE is hereby given, that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS, holding, previous to Midsummer last, £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 27th instant, at Twelve for One o'clock, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring a Dividend to Midsummer last; to make a call of 5 per cent. upon the New Stock, payable the 1st of November next; and on other business.

By order of the Court of Directors,

CHARLES PRIDDEN, Secretary.

70, Bankside, Southwark, S.E.

September 8, 1865.

The half year's Dividend, at the same rates as before (but without arrears), will be payable immediately after the business of the Meeting has terminated; and afterwards at the Company's Office, at Bankside, on Thursday, the 28th instant, from the hour of Twelve till Three; and also on Wednesday, the 4th of October, from the hour of Two till Four o'clock; and then will be forwarded by post.

COMMERCIAL GAS COMPANY.—Notice is hereby given that the next ORDINARY MEETING of the Company, will be held at the London Tavern, Bishopsgate Street, in the City of London, on FRIDAY, the 6th day of October next, at Twelve o'clock at Noon, to receive the report of the Directors, and to declare a Dividend to the 30th day of June last.

The Books of the Company will be closed for the Transfer of Shares, from the 22nd day of September to the 6th day of October now next ensuing.

By the Company's Act of Incorporation, Shareholders can inspect the Books of the Company during one fortnigbt before and one month after the Meeting.

By Order of the Board,

GEORGE JAQUES, Secretary.

Stepney, Sept. 14, 1865.

SOUTH METROPOLITAN GAS- LIGHT AND COKE COMPANY.

NOTICE is hereby given that an ORDINARY MEETING of the PROPRIETORS of this Company will be held at the London Tavern, in the City of London, on TUESDAY, the 10th day of October next, at Two o'clock precisely, to receive the Directors Report and the Accounts of the Company for the half year ended June 30th last; and to declare a Dividend for the same period.

By order,

THOMAS LIVESEY, Secretary.

Old Kent Road, Sept. 18, 1865.

SHALE-FIELD TO LET.

THE SHALE-FIELD of WEST- FIELD, in the co. of FIFE, containing a seam of shale rich in oil, WILL BE LET for such a number of years as may be agreed on. A rough coal, well suited for decomposing the shale, will be let along with it. It is situated on the lands of Capledrae, well known for their rich gas-coal, which produces the largest quantity of oil of any coal in Scotland, except Boghead.

Apply to the Proprietors, J. and R. AYTOUN, 3, Fettes Row, EDINBURGH.

MANUFACTURE of Gas from Tar in Ordinary Retorts.

LORBERG'S PATENT.

This process, by which an excellent quality of gas is produced in the ordinary apparatus, is particularly recommended to gas companies in the provinces, where not unfrequently the tar accumulates in inconvenient quantities.

Address, Mr. JOHN DAVIES, Surgeon Dentist, 24, Ludgate Hill, LONDON, E.C.

GASHOLDER required by the Hornsey Gas Company, from 60 to 70 ft. diameter by 16 or 18 ft. deep, with all requisite columns, girders, bolts, &c., and to be erected close to the Hornsey Station (near London) of the Great Northern Railway.

Full particulars, and the shortest time for completing the same, to be sent to D. HULETT and Co., 55, HIGH HOLBORN, W.C.

The brick and stone work will be done by the Company.

WATSON'S OVERTON CANNEL COAL.

THIS Coal, which yields 13,000 cubic feet per ton, is far superior to any other Scotch cannel coal (except Torbanehill) for making gas. It gives rather more than one-third of its weight in coke of excellent quality. Containing 90 per cent. of combustible matter and heat-giving material. In these respects the Overton cannel is greatly superior to the Torbanehill coal.

Orders for the above will have every attention, and shipped with despatch at the following ports:—Leith, Granton, Bowness, Charleston, Glasgow, and Greenock; and can also be delivered at any railway-station in Scotland.

For price, &c., apply to the Proprietor, JOHN WATSON, jun., 123, St. Vincent Street, GLASGOW.

ESTABLISHED 1827.

JOHN BEVERLEY and SON,

MARK LANE, LEEDS.

Manufacturers of Patent Metallic Wet Gas-Meters, Station-Meters, Experiment-Meters, Governors, Pressure-Gauges, Syphon-Pumps, &c.

Inventors and sole manufacturers of Beverley's double-cased Gas Cooking Apparatus, unequalled in economy, comfort, and cleanliness.

Meters of any maker altered and put into complete repair, to meet the requirements of the Sale of Gas Act.

WEALE'S SERIES.—Catalogue on application.

A TREATISE ON GAS-WORKS, and the Practice of Manufacturing and Distributing Coal Gas. By SAMUEL HUGHES, C.E.

Second edition, illustrated, revised by WILLIAM RICHARDS, C.E., price 3s.

VIRTUE BROTHERS and Co., Amen Corner, LONDON.

BEST AND HOBSON,

LATE

ROBERT BEST,

100, CHARLOTTE STREET, BIRMINGHAM,

Manufacturers of

CHANDELIERS, PENDANTS, BRACKETS,

Brass and Iron Gas-Fittings, Steam and Water-Cocks, &c., &c.

Also,

PATENT WELDED IRON TUBES,

For Gas, Steam, Water, and other purposes.

GAS APPARATUS OF EVERY DESCRIPTION.

High-pressure Water-Valves and Cocks, &c., &c.

Plumbers Brassfoundry,

BRASS, COPPER, COMPOSITION, AND LEAD TUBES.

Works: Birmingham, and Great Bridge, Staffordshire.

WALTER MABON & CO.,

Engineers,

ARDWICK IRON-WORKS,

FAIRFIELD STREET, MANCHESTER,

MANUFACTURERS OF

IRON TANKS, GASHOLDERS,

GAS APPARATUS,

PIPES, VALVES, IRON ROOFS,

WROUGHT AND CAST-IRON GIRDERS.

DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

1862.

PATENT ANTIMONY PAINT.

CLASS II.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

This Paint having been in general use over four years (especially in some of the principal Gas-Works) and proved itself the best light-coloured paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (28s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs under 20s. per cwt., as compared with White Lead at 28s. per cwt.

CONTENTS.

Notes upon Passing Events:— PAGE

Satisfactory State of the Public Health 709
The Prospects of the Meat Trade. 709
Opening of the Bristol Industrial Exhibition 710
The Public Works of the Corporation of the City of London . . . 710
The Household Servant Question 710
The *Revue des Deux Mondes* on the Comparative Increase of Population in France and England 710

Leading Articles:—

The Leamington Local Board and the Gas Company. 711

Circular to Gas Companies:—

The Act for Awarding Costs in Certain Cases in Private Bills . . 713
The Labour Question 713
Further Reduction in the Price of Gas by the South Metropolitan Gas Company. 713

Communicated Article:—

Experiments on the Action of the Sulphides of Ammonium upon the Bisulphide of Carbon and Sulphuretted Hydrocarbons in Coal Gas . 714

Correspondence:—

Constant Water Supply 715
Regulators *versus* Double Taps for Public Lights. 715
Reading Public Lamps 716

Register of New Patents:—

Tye, R.—Sliding Gaseliers, Gas Pendants, and Gas-Lamps 716
Atkins, T.—Apparatus for Regulating, Adjusting, and Indicating the Supply and Flow of Hydrocarbons and other Gases 717
Keeling, J.—Apparatus for Regulating the Supply of Gas 717
Bousfield, G. T.—Manufacture of Illuminating Gas 717
Boulton, M. P. W.—Obtaining Motive Power from Aëriform Fluids and from Liquids 718
Myers, E.—Wet Gas-Meters 718
Barnsley, J.—Seamless Metal Tubes 718
Bardwell, W.—Utilizing Sewage and Urine 718
Brown, G.—Pipes, Tiles, &c. 718
White, J.—Closets and Commodes 718
Tongue, J. G.—Apparatus for Raising and Drawing off Liquids and Gases. 718
Brooman, R. A.—Liquid-Meter 718
Orford, C. W.—Measuring Water and other Fluids 718
Gray, Sir J.—Taps or Cocks 718
Bird, H.—Treating Sewage Matters 719
Henry, M.—Governors 719
Ramsbottom and Blackburn—Hydraulic and other Engines for obtaining Motive Power 719
Byrne, J.—Governors 719
Gillespie, J.—Retorts, Crucibles, &c. 719
Wolstenholme, J.—Implement for Cutting Pipes and Bars of Metal . 719
Max, L. P. E.—Treating Oils and Hydrocarbons. 719
Parker and Tanner—Manufacture of Oxygen Gas 719
Payton, W.—Measuring Water or other Liquids. 719
Applications for Letters Patent 719
Grants of Provisional Protection 720
Notices to Proceed 720
Patents which have become Void 720

Miscellaneous News:—

Meeting of the Shrewsbury Gas Company. 720
Metropolitan Board of Works 720
The Leamington Local Board of Health and the Gas Question . . 721
Meeting of the Phœnix Gas Company 722
Meeting of the Crystal Palace Gas Company 724
Meeting of the County and General Gas Company 725
Novel Experiment in Cleaning Corroded Water-Mains 726
Opening of Wisbeach Water-Works 726
Researches on the Volatile Hydrocarbons 726
Proposed Utilization of Sewage at Preston 729
The New Water Supply at Hawick 729
Explosion of Gas at Torquay 730
Cornish Pumping-Engines 730
Cannel Coal and Coal Oil Manufacture in Australia 730
Fatal Explosion of Naphtha in Sheffield 730

Share List of Metropolitan Gas Companies 729
Price Current 729

TO CORRESPONDENTS.

Mr. TOMLISON'S *and* Mr. HALL'S *letters on the constant supply of water are unavoidably postponed in consequence of the pressure on our columns, but will appear in our next.*

Will Mr. H. GORE, *late of Valparaiso, kindly favour us with his present address?*

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15*s.* per annum, if paid in advance during the month of January, or 18*s.* credit, in two sums of 9*s.* each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, October 17, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 3, 1865.

Notes upon Passing Events.

ACCORDING to the calculation of sanitary doctors, long before this month the country ought to have been ravaged by cholera and typhus fever, but up to the present time these doleful predictions have not been realized, and our medical Cassandras have only had the small satisfaction of two suspicious cases at Southampton, while the weekly death returns of the Registrar-General have shown an unusualy low rate of mortality. This fact, so provoking to the class who have been looking for a fresh crop of disease and official appointments, so satisfactory to the country, must not tempt the people of London to indifference in the matters of air and water. We have recently learned from the very exact records of the Fever Hospital, that there are certain districts of the metropolis which breed typhus, and as surely and regularly as the professional fishermen of the Thames breed maggots for the use of their customers. This fact must be dinned into the ears of parochial authorities until they are fully impressed with its financial importance. A typhus-breeding court or alley means a certainly recurring and constant expense to the parish in which it exists. The means for abolishing such a pauper-making nuisance are well known, may be costly in the first instance, but must be cheap in the end. Local Boards of Works ought to have the power of acting on the reports of their officers, and of taking compulsory possession, for the purpose of repair or destruction, of any blocks of building proved to be the resort of fever for a given period. Where compensation was found to be due *after the alterations—and it ought not to be assessed before*—there it should be raised by a special rate. In most instances it would be found that the alterations that banished the fever were for the eventual benefit of the landlords. The question of water supply bears closely on the fever question. Private wells and pumps having disappeared in most great towns where sewers, water-mains, and gas-pipes have been introduced, it becomes absolutely necessary to provide specially for water supply to the poorest classes of the community. In London the water question will never be satisfactorily settled until, for the benefit of all classes, high as well as low, the old intermittent system, with the nuisance of cisterns, has been superseded by constant supply. But in reference to the labouring classes, there is no more reason why they should be supplied gratuitously with unlimited quantities of water by the water companies, than of beer. But as the landlords of houses below a certain rent are charged with the parish rates, which are charged in the rent, so it would be advisable that in all houses, and especially in the case of those occupied as lodgings, by the labouring classes, the water-rate should be imposed on the landlord, to be by him included in his rent. He should no more be allowed to let a house without water than without windows—if of modern construction, or capable of being adapted to water supply. To meet the not unfrequent instances in which, under the intermittent system, the inhabitants of whole blocks of houses are without water for twenty-four hours or more, it would be well to establish in the nearest street a water-tap, on the principle of the fountains of the Continent, where water could be always had by the inhabitants of the court or alley for whom it was set apart. The habit of perfection of arrangement has its disadvantages as respects public morals. As a rule, our urban, and especially our metropolitan labouring population, is better supplied with water than the same class on the Continent. There is a great deal of house distribution and high pressure; but although our people are not usually put to the expense of buying their water by the pail, or the trouble of fetching it from the fountain, there are instances where water can only be had from the public-house, and in such instances a street-tap, with a dozen or more anti-waste cocks, would be a greater boon than a bath and washhouse. The paltry drinking fountains that disfigure the streets of London are useful, although contemptible in an artistic point of view; but some fountains for those who want to wash as well as drink are much wanted to supply the place of closed or poisoned pumps.

The English people have long been accused of extravagance

in their butcher's bills. If the pest which is now blasting our flocks and herds continues a little longer, economy in flesh will force itself into every kitchen. Already the meat trade is dammed at its source. We are fed from the already provided supply of fat animals; but the districts where the greatest number of animals, especially of beasts, are fed, are not the districts where they are bred. Under our farm economy it is found most advantageous, in corn-growing and in the richest pasture counties, to take the mature animal from the hands of the breeder in order to put flesh on him; hence great fairs of animals, either young or in *store* condition, ready to be finished by the corn farmers in yards, or the graziers of the midland counties in their fat pastures. We are now consuming the fat stock which, in fear of disease, the owners are willing to hurry to market. But the feeders dare not go to market and buy; they alike fear to invest money on what may be worthless before it arrives home and to infect the animals they have at home; therefore let meat consumers understand that twelve months must go round before they experience the full effect of breeders without customers and feeders with empty yards, and stalls, and pastures. In the meantime we hear some comical things from those of our public inspectors who have recently turned from high philosophy and pure art to the common things of domestic life.

Bristol has opened an industrial exhibition without the assistance of any great gun, and with a degree of sensation and brilliancy that our London guarantors must really envy. The prominent part, in the absence of Lord Palmerston, fell on the mayor, and he seems to have acquitted himself to the satisfaction of all parties. He has the good fortune not to hold his office like the Lord Mayor, by rotation, but to have been actually selected by the consent and goodwill of his political opponents because he was the best man; and being a self-made man, was specially fitted to open an exhibition of industry.

The Corporation of the City of London seems doomed to be unfortunate even when working with the best intentions. A splendid subscription of £1000 towards the relief of the sufferers by the cattle plague has not met with the support it deserved. The attempt to obtain a plan and design worthy of the City for the Metropolitan Meat Market has proved a lamentable failure. Mistaken economy seems likely to land the City in a costly job. Architects capable of grappling with complicated arrangements are not to be caught by a lottery with paltry prizes and a large chance of blanks. The sooner an architect of proved reputation is called in to advise the mysterious committee the better. The time has passed for sending in tenders for the Holborn Viaduct, and we hear nothing of the result. Rumours are afloat that the lowest tender exceeds the estimate of the architect by £100,000, and that, consequently, the Corporation will have to go to Parliament for more money. What will Parliament say? And still more important, what will the Metropolitan Board—the active rival of the City authorities—testify? In the meantime all is involved in mystery, while the Common Council debates in public, with much form and noise, insignificant questions. This City Parliament never really discusses or controls a Budget of Building. The most extensive operations are entrusted to a committee of five, and that committee only reports to the grand committee when it wants more money, and the grand committee debates with closed doors. So as long as the funds hold out there is no real check against any excess of expenditure. Will some independent member of Common Council inquire at an early meeting who tendered for the Holborn Viaduct, and what was the lowest tender?

Every autumn regularly brings out in the most popular journals a sham correspondence, and a series of essays on domestic affairs. A year ago, the subject of dinners occupied the columns of the *Times*, and, apparently, serious attempts were made to teach those whose limited fortunes confine them to a soup, fish, a joint, and game or poultry, how to give the elaborate entertainments of those who, whether alone or with friends in the house, always sit down under the gaze of an array of attendants to the elaborate productions of a real artist. Of course, the idea was ridiculous. You might as well give directions for making a yeomanry regiment, with its jolly farmers and horses from the plough, equal to the 11th hussars or the 5th dragoons; but it was amusing, and that is perhaps enough. This season the iniquities and deterioration of servants have incited smart correspondence and elaborate essays in the *Telegraph* and the *Pall Mall Gazette*. That great art critic and ridiculous political economist, John Ruskin, has taken part in the fray, without giving any practical hint for turning a sow's ear into a silk purse, but favouring his readers, few of whom read Greek, with a very happy quotation from Xenophon, and a bit of interesting information as to his own establishment—viz., that he keeps a cherry-tree for the benefit of the blackbirds, and that like every sensible man who *uses* a garden, he is allowed by his gardener to pluck flowers and gather fruit. Another writer attributes the assumed deterioration of servants to the facilities for locomotion. Nearly a hundred years ago Arthur Young made the same complaint, and deplored the rapid economy of the stage at 15s. for a journey of a hundred miles, as compared with the once-a-week broad-wheeled waggon. In the same way, to go further back, Columella, in describing the Roman agriculture of his day, deplored the deterioration of the slaves, as compared with those of far-back centuries. A writer of no mean power, in the *Pall Mall Gazette*, whose experience in England seems confined to London, sets up foreign servants as superior to ours, taking apparently his example not from Paris, but from life in French country houses. All this is very well for agreeably filling up daily pages in the dull season, but that it will have the slightest effect in making masters economical, or servants less fond of change and high wages, no sensible person believes. When a silly person writes to the *Telegraph* and describes how what he thought was a model servant took a burglar for her sweetheart and robbed him, he makes no more case against servants than if a coachman—as some coachmen could—were to write and describe how a master took him on a journey, became bankrupt, and bolted to America and left him without his wages, and with a large sum out of pocket for hotel bills. There are just as many good servants as ever there were for those who care to have them; but London life requires smart, ornamental servants—London life separates masters, mistresses, and servants so completely that there can be no tie between them but the tie of wages. In London, too, beside the competition between masters for smart servants, there is the competition of marriage and business; the butcher's, the baker's, the grocer's journeyman have each in view to settle some day with a cook or housemaid who has saved some money. They know that a good servant makes a good wife. Butlers and footmen know that in London, after a certain time, service will be closed to them, so if prudent and frugal they retire in time. But if you go into the country, in the houses of the squires who do not aspire to live like lords, and of the increasing class of gentleman tenant-farmers, you will find plenty of men-servants like the *Pall Mall Gazette's* foreign model, able and willing to turn their hands to anything, and a good deal cleaner than that French coachman whom we know very well, who, in a dirty cravat and doubtful shirt, waits at luncheon and dinner, polishes the floors, and drives on occasion a pair of rough horses in dingy harness before a carriage that rattles in every joint. English life is expensive, and always will be expensive, because there is a taste in the country for *completeness* and perfection. It is to be seen in the finish of drawers and other furniture out of sight—a luxury unknown on the Continent. It is to be seen in the neatness of private gardens, and in all domestic arrangements. But you cannot have the economy of the Continent and completeness of an English house and garden any more than you can get our labourers to dress in a short blue smock, without a coat, no stockings, and wooden shoes. The cockney writer in the *Pall Mall Gazette*, complains that English horses will not travel as far as French horses. It is evident that he takes his notion of our breed from the specimens that prance through Belgrave Square, or crawl in fly-broughams about Regent's Park. Let him sit behind a surgeon in country practice, or a parson who does duty in two parishes, or even take a place in the carriage of a hunting squire of a thousand a year, and he will change his opinion. Servants and horses in London are often merely ornamental; you must go into the country to find utility, and there it is as plentiful as on the Continent. So, too, a lady who can afford to trust a cook or housekeeper to market for her, saves much trouble and pays for it. If economy is an object, she must see the butcher and the poulterer herself.

A recent number of the *Revue des Deux Mondes* has an article on the comparative increase of population in England and France, written in a calm and not unfriendly spirit as regards us, but curious, because ingeniously and covertly recommending a return to protective duties in regard to agricultural produce. The writer argues that the more slow

increase of population in France than in England and in the North of Germany is a sign not of weakness but of strength, and he only regrets the increased tendency of the French population to resort to towns. We generally consider that the late cotton famine was so met by public and private assistance, and by the arrangements of the workpeople themselves, that it removed all fears for the future of England, and did not produce anything like the evils anticipated. The French reviewer takes a much graver view of our troubles, and looks with dismay on that emigration which we consider the natural remedy for any check to employment. He observes:—"In the "midst of extreme inequality in social position, no people have "exhibited more of the feeling of (solidarity) sympathy be-"tween all classes than the English people—a sure pledge of "a powerful patriotic spirit. But the effects of patriotism and "charity, great as they were, had almost reached their limits." All the world felt that if the crisis were prolonged it would be impossible to support the numerous cotton hands out of work. As it was, they were pressed to emigrate, and the means were organized on a great scale. "Behold, then, what are the "consequences of this much-praised economical system—"exile to a distant land, the violent rupture of all the ties "which attach the heart of man to his birthplace, emigration "with all its dangers, regrets, and miseries—this is what "England offers as a last resource to her overabundant "population! Shall we envy her this position?" This is a very natural tone of argument in the mouth of a Frenchman, who does not know that it was the workmen who wished to emigrate, and the manufacturers who wished to retain them, and who looks with a horror on crossing the sea and settling on virgin soil, unknown to the annual army of colonists of the Americas and Australia. He points out dangers we do not see in our immense dependence on foreign countries for corn. He admits that we are in a good position to obtain supplies even in case of war, but he argues that France dare not by diminished agricultural production trust herself in the same position, as in case of European war she might be starved out. The paper is fairly written, although, in our opinion, founded on false premises. The writer does not seem to know that his countryman, Lavergne, has proved that France, cultivated as England is, would nearly double its corn production.

THE LEAMINGTON LOCAL BOARD AND THE GAS COMPANY.

The dead lock to which the arrangements for lighting the public lamps at Leamington were brought by the intervention of Mr. Hughes, as noticed in our last, has became more inextricably involved by the subsequent proceedings of the Local Board. Those who are acquainted with the antecedents of Mr. Hughes might have anticipated that his appearance on the scene would not contribute to an amicable settlement of the differences between the Board, their clerk, and the company. It is stated in a local paper, "There seems to prevail in the mind of "the clerk the most bitter feeling towards the gas company," and that he has exercised his influence in exciting a similar feeling in the Board. It might, therefore, be readily supposed that the bringing in of Mr. Hughes was like throwing a firebrand among a heap of faggots. They blazed furiously, and the gas company prudently forbore from approaching the conflagration. There was no reason why they should, for their Act is sufficiently explicit on the subject of public lighting to indicate what is to be done; and if the Local Board and their clerk would only cool down, and read it by the steady light of common sense, they would see that there was no necessity to call for the aid of an engineer from London to arrange what had been already prescribed by Parliament. Indeed, all the clauses relating to public lighting were inserted in the Act at the request of the Board, and as those clauses provide for every contingency that can arise, the gas company very reasonably refuse to be entangled in negotiations having for their object modifications of the obligations imposed on each party by the provisions of the Act, or to recognize any variation from them proposed by Mr. Hughes.

The communications between the Board and the company up to the 11th of September were inserted in our last number, and on the 19th the Board attempted to re-open the subject by instructing their clerk to invite the directors to a conference "upon the question of public lighting," at which "Mr. "Hughes, of London," would attend on behalf of the Board. It appears from the reply of the chairman that it was not convenient for the directors to attend on the day named, and the invitation was accordingly courteously declined, the Board being at the same time reminded that no propositions had been made by them as required by the Act, nor any answer given to the offer of the company. We subjoin the correspondence on these points:—

Leamington Local Board of Health, Sept. 19, 1865.

Dear Sir,—On fly-sheet I send you copy resolution of the board passed at their meeting to-day, inviting an interview with directors of the Gas Company on Tuesday next, the 26th inst.

I am instructed to inform you that Mr. Hughes of London will attend on behalf of the board.—I am, &c., R. A. Wallington.

P.S.—The annual meeting of the board will be held at eleven o'clock on the above day; but the board can adjourn to any hour that will suit the directors.

John Maughan, Esq. Chairman of the Leamington Gas Company.

Resolved upon unanimously—"That the clerk do write to the chairman of the Gas Company, inviting an interview with the directors on Tuesday next the 26th instant, at the Town-Hall, Leamington, upon the question of the public lighting."

7, *Lancaster Terrace, London, Sept.* 21, 1865.

Dear Sir,—I have to acknowledge the receipt of your letter of the 19th inst., inviting the directors to an interview with the local board on Tuesday next, upon the question of the public lighting. I regret that other engagements will prevent my accepting the invitation. I believe one or more of my colleagues are from home, and would likewise be unable to attend.

I beg, however, to draw your attention to the 48th section of the company's Act, and to remind you that your board has not yet stated in writing, in the terms of the Act, how much gas they require to be supplied to the public lamps; nor has any proposition been yet made to us for the hire or purchase of our lamps-columns; nor has any reply been given to our offer in respect of service-pipes, lamps, burners, and stop-cocks. You must surely see that we cannot usefully meet your board to discuss terms until we have a clear and distinct proposition before us. That proposition had better be in writing, as the Act directs, that we may deliberate upon it, and give to it a duly considered answer.—I am, &c.,

J. Maughan, Chairman of the Board of Directors.

R. A. Wallington, Clerk to the Leamington Local Board of Health.

Several meetings of the Local Board have since been held, but what occurred on the question of the public lamps has not been made known, the reporters having been excluded on such occasions in consequence of the publication, contrary to the wish of the clerk, of the "private letter" of Mr. Hughes, in which he offered to superintend the arrangements for the public lighting on specified terms. That letter was read at the meeting at which the report of Mr. Hughes was submitted for consideration, and, by a resolution of the Board, the offer of his services on the terms named was accepted. There was nothing of a private character in the proceeding, and the ratepayers had unquestionably a right to know how their money was expended. But Mr. Hughes had his reasons for not wishing his offer to be known, and the clerk issued his mandate to the reporters—it is said, "in a *brusque* and cavalier manner"—not to publish it. His orders were not implicitly obeyed; consequently at his instigation the reporters were afterwards excluded. This conduct has roused the unanimous indignation of the local press, and has enlisted their sympathies with the gas company. The Local Board are required by their bye-laws to hold their meetings publicly, and the reporters attend them as part and on behalf of the public, but the clerk of the Board seems to entertain the opinion that they are bound to suppress anything which he considers inexpedient to be generally known. The reason for the required suppression of Mr. Hughes's letter is stated to have been that that gentleman "was afraid the letter might get into the possession of the "editor of the *Gaslight Journal*, or some similar publication;" and the clerk thought its publication so great an offence, that he begged Mr. Hughes's pardon for the treatment to which he had been subjected. It is with some satisfaction that we perceive this acknowledgment by Mr. Hughes that he feels the force of our criticisms of his schemes. We pride ourselves on having exposed many jobs that might otherwise have been snugly managed in the dark, and that which the Leamington Local Board are now attempting to perpetrate we shall not allow them to screen from sight.

The exclusion of reporters on the ground alleged has been taken up in a proper spirit by the local press. It is the duty of reporters to give an impartial account of all matters of public interest that are brought forward at meetings of the Board, and the assumption by their officer of power to dictate what portion of the proceedings shall be published and what suppressed is indignantly repudiated. If the acts of the Board, it is observed, are for the good of the town, they need not fear publicity; and the mode that has been adopted of evading it by "resolving into committee" when the public lighting is discussed, may be an adroit *coup* of their legal adviser, but it tends to excite suspicion and increase distrust. We have elsewhere transferred to our columns, from the *Leamington Courier*, a humorous sketch by "our ideal reporter" of the supposed

proceedings at a meeting of the Board from which other reporters were excluded; and, though much more amusing, it will be found only a few degrees more absurd than the speeches and doings reported when the matter-of-fact representatives of the press were allowed to be present.

As the result of the secret conclaves of the Board there appeared an invitation to ironfounders to tender for the supply of 600 lamp-posts, according to drawing and specification to be obtained of Mr. Hughes. We have been favoured with a sight of the design for the column, and of the specification; and to enable our readers to appreciate its artistic merits, compared with those now fixed in the principal streets of Leamington, we have had them engraved, and placed side by side in another page. The specification stipulates that the lamp-posts must be 12 feet in extreme length; the octagon base above ground is to be inscribed within a circle of 15 inches diameter, and to be 13 inches in height; and in the lamp-posts that are to receive meters the octagonal base is to be fitted with a cast-iron door, forming two sides of the octagon, and 12 inches deep, and to be provided with a good lock and key. It will be remembered that the chairman of the gas company in his letter of the 11th of September required that every lamp-column provided by the Board should be prepared for the reception of a meter, but it appears that 50 only of the 600 columns to be contracted for were intended to be so prepared.

As the contract with the gas company was about to expire, the Board became alarmed at the possibility of the town being left in darkness by their mismanagement, and at the twelfth hour a special meeting was convened on the subject for the 29th of September, after the contract had terminated. Taking advantage of the 48th section of the gas company's Act, which requires them, without any notice being specified, to supply the public lamps with so much gas as the lighting authority may desire, a resolution was passed that the company should be required to supply gas at the rate of 4 feet per hour to each lamp for three months, and to light, clean, and extinguish at the rate of 13s. per annum. The reporters were permitted to be present at the special meeting, and a brief report of the proceedings has been published, including copies of the following letters between the chairman of the company and the secretary of the Board:—

7, Lancaster Terrace, London, Sept. 28, 1865.

Dear Sir,—The contract subsisting between the board and the Leamington Gas Company relative to the supply of gas to the public lamps will, as you are aware, expire to morrow. On behalf of the company, I beg to repeat the request conveyed in former communications, that your board will be good enough to state, *in writing*, as directed by the Act, how much gas they desire the company to supply. I wish it to be understood that the company cannot go on lighting the public lamps without having a proper agreement with the board, and that the company must discontinue the supply of gas if the board do not at once enter into such agreement. Do the Board of Health wish the present contract to go on for another year?—I am, &c., JOHN MAUGHAN,

Chairman of the Board of Directors.

To R. A. Wallington, Esq., Clerk to the Leamington Local Board of Health.

Town Hall, Leamington, Sept. 29, 1865.

Dear Sir,—I am directed by the Local Board of Health for the district of Leamington to acknowledge the receipt of your letter of the 21st inst. I am also directed to forward you a duplicate notice for the supply of gas for three months, from the 29th of September, one notice having been this day left at the office of the company. With reference to your requirement that the board should give the company notice in writing as to how much gas they require to be supplied to the public lamps, I am to remind you that the clause to which you allude has reference only to burning gas by contract, and has no operation in case the lighting authority burn by meter. As regards the gas columns, the board have always intimated to you that they have left that question to Mr. Hughes, their engineer; they, however, decline to purchase by valuation to be settled by referees, and they are not in a position to make any offer for the columns, but I am directed to remind you that the board have advertised for tenders for new columns, and the same will be taken into consideration on Tuesday next. I may add, that if all other matters are amicably settled between the board and the company, including the use of the double tap, which is a *sine quâ non* with the board, and the company are willing to sell their columns, or at least such as can be adjusted to meet the present requirements, at a fair price, the board would be inclined to purchase; but if the board are to have litigation respecting the double tap, then the board are of opinion that it will be best for them to provide new columns. I am directed by the board to state that as regards service-pipes, lamps, lamp-burners, and stop-cocks, that the board are advised that if they light, clean, and extinguish, the company are bound to provide all those things free of expense to the board. There is one thing the company admit they are bound to provide, and if they have any claim for compensation it will be competent to them to enforce such claim against the board hereafter. The board wish to be informed whether they are to consider your letter of September the 11th as notice, under clause 50 of your Act, that the company wish to have meters attached to the whole of the lamps, because the board cannot take notice of your letter unless the same is a legal notice within the meaning of the Act of Parliament. I have to request an answer to part of the letter on or before Tuesday next, when the tenders for the columns will be taken into consideration.—I am, &c., R. A. WALLINGTON.

To J. Maughan, Esq.

It appears, therefore, that the Local Board are determined to nail the double tap to the mast, and to fight for it to the last gasp, or as long as the ratepayers will let them; and the clerk is reported to have asserted "that they would use the "double tap in spite of the gas company, the quarter ses-"sions, or any threats whatever." He still seems to be in ignorance of the 51st section of the company's Act, which distinctly prohibits any obstruction to the free passage of the gas from the regulating apparatus to the burners; and if the Board adopt his interpretation of the Act, they will be involved in the meshes of the law beyond the power of their legal adviser to extricate them without disgrace and great expenditure of the ratepayers money. The hostility of the clerk of the Board to the gas company was very strongly manifested at the last meeting, but as it is to the advantage of his profession that there should be disputes, he may be excused the use of stimulating language. We are inclined to think that some of the opinions attributed to him must be incorrectly reported, for it could scarcely be possible, even for one who in perusing the Act had overlooked an important section, to have made such a mistake as to declare that, if meters were affixed by the gas company to every lamp, "indications need only be taken "when and where the Board thought fit."

It is unfortunate for the Leamington Local Board that just after they have taken their stand on the double tap as a *sine quâ non*, there should be accumulating evidence against it. Mr. Gascoyne, one of their members, has paid a visit to Reading, to judge for himself of the lighting of the town, and the effect of the much-vaunted double-tap, and he represented the average consumption of gas to be from 3¼ to 3½ feet per hour, instead of 2½, as had been stated; that at ten o'clock, when the first pressure was taken off at the gas-works, the flame was reduced half an inch, and that at twelve o'clock, when the pressure was further taken off, the flame was reduced an inch and a quarter. In confirmation of Mr. Gascoyne's observations, we append the report of the lamp inspector at Reading, which contains diagrams of the exact size of the flames of the lamps in the early part of the night, and at twelve o'clock, taken from actual measurement. "This triumphant result of gas engineering," observes a local paper, is not achieved by the saving of half the gas, as represented by Mr. Hughes, for the average consumption is about 3¼ feet, and the arrangement has the very questionable advantage of giving the most light when the shops are open and it is least required. An impartial witness, a gas engineer of twenty years standing, who has recently arrived in this country from abroad to inspect and report on the various methods employed for regulating the consumption of gas in street-lamps, has addressed a letter to a Leamington paper, stating some of the results of his observations. The town of Reading, he reports, is one of the localities where the public lighting is most defective; and he expresses himself strongly against the professed panacea of the double tap, which he declares to be imperfect as a mechanical arrangement, defective as a safeguard against fraud, and it seems to him almost incredible, "that any one assuming the "title of engineer should propose such a system of regu-"lation for street-lamps." It has been stated that the double tap affords peculiar facilities in lighting and extinguishing the lamps; but the lighting-pole can be used with equal readiness without it, and where the ordinary self-acting pressure-regulator is fixed in the lantern. Mr. Muddeman, the chairman of the Board at their special meeting, has also discovered that the double tap increases the illuminating power of the gas, and he expects that by its marvellous influence 3 feet of gas may be made to give the light of 5! This would be indeed an important advantage which even Mr. Hughes has not anticipated; and if Mr. Muddeman can practically apply the discovery, it will be the best means of overcoming the powerful objections at present advanced to the use of the double tap.

A meeting of the directors of the Leamington Gas Company was held yesterday, at which we understand it was resolved to comply with the requisition of the Local Board for the supply of gas to the public lamps, at the rate of 4 feet per hour to each lamp, as soon as the requisite burners can be fixed, and that the company will in the meantime continue to light the streets with the present 5-feet burners; but that they shall require the Board to pay a reasonable compensation for the use of the lamp-posts, in addition to 3s. 3d. for lighting, extinguishing, cleaning, and repairing the lamps for three months. The company, we understand, will offer their lamp-

columns to the Local Board at the lowest price of any of the tenders that may be sent in; but the company will firmly refuse to permit the use of the double tap, except by a decision of the chairman of the quarter sessions. The Local Board meet to-day to receive the tenders for the lamp-posts, when they will have the opportunity of cogitating over the resolutions of the directors; but, as they have got three months breathing-time, they will probably not adopt any further hostile proceedings until after due consideration.

The case of the Local Board of Leamington and the gas company strongly exemplifies the advantage possessed by a gas company incorporated by special Act, of having the rights and obligations of all parties clearly defined. When they are vague and uncertain, or when the company's Act is silent respecting the conditions on which a supply of gas is compulsory, negotiation becomes necessary. But in the case of Leamington—thanks to the Local Board—the conditions on which the public lamps and private consumers are to be supplied are prescribed, and a tribunal has been provided, in the quarter sessions, for the decision of the only question that ought to arise between the parties. Other matters, it is true, have been forced into consideration, and the hostile attitude assumed by the Board has prevented an arrangement of them, otherwise the dispute, about which there has been so much correspondence, might have been settled without difficulty, to the advantage of all concerned. But the main and the only question about which there ought to have been any difference was the kind of regulators to be employed; and, notwithstanding all the wrangling that has occurred, that question must be decided by the appointed tribunal, and it will then, we trust, be allowed to rest.

All the contention at Leamington has arisen from the desire of the Board to save 15s. or 18s. a lamp by reducing the consumption of gas, but it seems probable that the result will be an increased expenditure for public lighting. It depends on the Board to determine the quantity of light they consider fitting for the inhabitants of "Royal Leamington," which it is admitted has hitherto been one of the best-lighted towns in the kingdom. If less gas be consumed there will be less light, for no one, except such dabblers in gas lighting as Mr. Muddeman, believes that by the use of the double tap, or any such contrivance, the same quantity of gas will give a greater amount of light. The question for the ratepayers to consider is, whether by the arrangements of the Local Board they will obtain the light they require for less money than they have been accustomed to pay. Judging from what the Board have done and are threatening to do, we conceive they will not. Going to law may be a pleasant game to those who share the stakes, but it is far from amusing to those who have to pay the costs; and whether the Board or the company be the winners, those ratepayers who are also consumers of gas will have to pay the costs both of plaintiffs and defendants. They will first be taxed directly to defray the expenses of the Board, including the salaries of Mr. Hughes and his assistant; and they will be taxed indirectly by having to pay a higher price for gas consequent on the expenses incurred by the company. In any case the ratepayers and gas consumers must lose, and the only gainers will be Mr. Hughes and the lawyers.

Circular to Gas Companies.

The time of year is approaching when the concoctors of consumers gas companies usually commence their speculations on the credulity of the public and the squeezability of gas companies. Public spirit or the benefit of gas consumers has rarely any share in the motives which influence the originators of such projects, and the exorbitant claims of a consulting engineer and local surveyor for their services in promoting an unsuccessful consumers gas Bill, mentioned in our last, afford an instance of the manner in which the promoters of such schemes endeavour to serve their own interests while affecting to labour for the good of the consumers of gas. Rumours have reached us of schemes in preparation that are directed chiefly against companies without statutory powers, and against the owners of private gas-works. Some companies, who have not been in Parliament since their original establishment, half a century ago, are also similarly threatened, and, unless they take measures to place themselves under the provisions of modern gas Acts, they may have to pay smartly for their neglect. Some protection against reckless speculators in competing projects, when brought before Parliament, and against vexatious opposition to the Bills of existing companies, has been afforded by a valuable Act passed last session, entitled "*An "Act for awarding costs in certain cases in private Bills,*" which will, we conceive, prevent in future such attacks as were made in the same session by the Kent Consumers Company on the Phœnix Company; by the Winchester Gas and Water Consumers Company on the Winchester Company; and by the Hanley Consumers Company on the British Company. The costs incurred by the Phœnix Gas Company in resisting the attack on them were stated by the chairman at their last general meeting to have amounted to nearly £1700, though the Bill of the competing company was rejected before one-third part of the evidence against it had been heard. The Act in question, when originally introduced, was intended to apply only to railway bills, but in its passage through Parliament it was made applicable to all descriptions of private Bills. The first clause provides that when the committee on a private Bill shall decide that the preamble is not proved, and shall unanimously report that the petitioners against the Bill have been unreasonably or vexatiously subjected to expense in defending their rights, the petitioners are to be entitled to recover costs, or such portion as the committee may think fit. Previous to the passing of this Act there was no effectual check against the introduction into Parliament of any competing gas Bill, however futile the pretext, and the promoters might work on the fears of a weak company to buy them off, in order to avoid the expense of a parliamentary contest. The prospect of having costs to pay, unless sufficient ground for competition can be shown, will we conceive be a "heavy blow and great discouragement" to such speculators. By the 2nd clause of the Act it is provided that when the committee shall decide that the preamble of a Bill is proved, and unanimously report that the promoters have been vexatiously opposed, the latter may recover costs from the petitioners, or such of them as the committee shall think fit. This is an important provision to established companies, who intend to apply to Parliament for increased powers, or for an Act of Incorporation, as it will protect them from the vexatious opposition to which the promoters of such Bills have been hitherto subjected. The next four clauses of the Act refer to the taxing of costs, the powers of the taxing officer, the recovery of costs when taxed, and the form of action in Scotland. The 7th clause gives power to any person from whom costs have been received to recover from other persons, who are liable their proportionate shares. The 8th clause relates to Bills on which money deposits have been made, and provides that, when the committee report the preamble not proved, the promoters shall pay the costs awarded to the petitioners out of the deposits. The promoters of a Bill, when not promoted by a company already formed, are defined by the 9th clause to be all persons whose names appear as promoting it. The meaning of a private Bill is defined to include any Bill for a local and personal Act. The Act comes into operation on the 1st of November next, and there can be little doubt that it will tend to diminish the number of speculative Bills and speculative oppositions in future sessions of Parliament.

The consideration of the labour question is forcing itself on the attention of the directors and managers of large gas-works, especially on those of the metropolitan companies. The subject was referred to by the chairman of the Phœnix Company, at the recent half-yearly meeting of the shareholders, who said he feared that there would ere long be a considerable increase, under the head of "wages," of the sum now paid. The value of all labour, skilled or unskilled, is unquestionably increasing, and stokers have at least as much claim as other labourers to ask for an advance in their wages. We believe the directors and managers of gas-works are disposed fairly to consider their claims if no attempt be made to enforce them by combination. It is the interest, and we have little doubt it is also the wish, of all who are engaged in the manufacture of gas, to deal liberally with those men who are occupied in the trying and arduous labour of the retort-house; and the high price of meat at the present time may be assigned as a cause why their wages should be increased. Any movement in that direction must, however, be carefully made, and be promptly and generally adopted when agreed to. Combination of the men to demand an advance of wages should in all cases be avoided, if possible, by timely concessions to reasonable requirements; and we trust that if what the men ask for is considered right to give, it will be given without delay.

The paragraph in our last number noticing the reduction in

the price of gas by the South Metropolitan Company requires correction. The price is the same throughout the whole of the company's district, and it is now reduced to 3s. 4d. per 1000 feet, without charge for meters.

Communicated Article.

(*All articles inserted under this head being copyright, the right of reproduction or translation is reserved.*)

EXPERIMENTS ON THE ACTION OF THE SULPHIDES OF AMMONIUM UPON THE BISULPHIDE OF CARBON AND SULPHURETTED HYDROCARBONS IN COAL GAS.

By Alfred George Anderson, Esq.,
Professor of Chemistry in Queen's College, Birmingham.

(*Continued from page* 660.)

It is, then, proved, that all the bisulphide of carbon and such allied sulphur compounds may be extracted from coal gas by sufficient washing with sulphides of ammonium. Gas companies would, however, justly hesitate to erect the necessary apparatus for accomplishing this end before being well assured that the one great object of their efforts—the maintenance of the maximum of the illuminating power of their gas—should not be interfered with by the employment of a process whereby the gas, as produced, would be subjected to the action of a copious shower of ammoniacal sulphides.

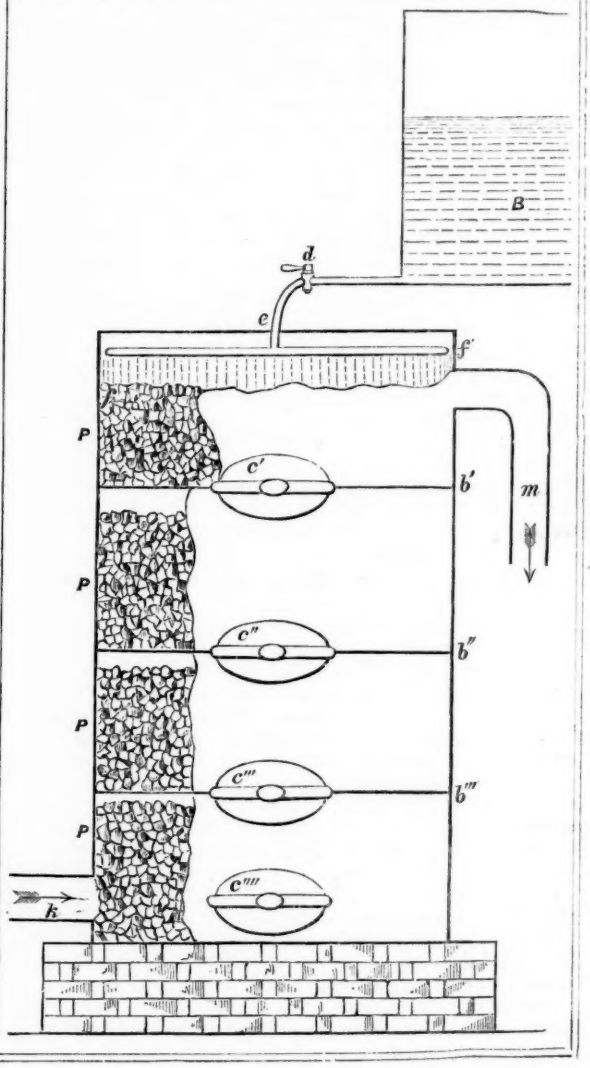
It is remarkable that whilst ample experimental opportunity must have been afforded for ascertaining whether contact with aqueous fluids, by possible absorption of some of the illuminating hydrocarbons, would, in a greater or less degree, consequently injure the illuminating power of the gas, there should be so much difference of opinion still existing upon the subject. Dr. Letheby, in a lecture delivered at the last meeting of the British Association of Gas Managers, held at Birmingham a few weeks ago, said: "It is a *fact* that water has little or no influence on any of the hydrocarbons, except acetylene, and as this exists in gas only to a very small extent, there is little or no danger from a copious washing of the gas before it goes to the purifiers." Again he says: "As washing the gas with water, or with weak ammoniacal liquor, and finally with water, will at once abstract a considerable amount of all these impurities (ammonia, sulphuretted hydrogen, and carbonic acid), and although there is a prejudice with some engineers that this kind of purification is objectionable on account of its lowering the illuminating power of the gas, yet, as we shall see hereafter, the prejudice is not founded on fact, excepting that the process undoubtedly removes such compounds as tar and naphthalin, which, though of high illuminating power, are nevertheless better out of the gas than in it, seeing how much mischief they do by subsequent deposition in the mains and service-pipes."

It is highly important that we should possess reliable data in regard to the effects of water-washing upon the gas, because it is extremely unlikely that there can be any essential distinction to be drawn between the effects of exposure of a current of it to streams of water or to streams of very weak ammoniacal liquor. And it is very improbable that any solvent power exercised upon the hydrocarbon illuminants by water would be interfered with by the presence, in solution, of a small proportion of sulphide of ammonium. Whether much washing in a scrubber with the *strongest* ammoniacal water procurable in gas-works, and which we now know is capable of taking out all sulphur compounds remaining after the sesquioxide of iron of the purifiers has done its work, does or does not affect illuminating power, is also obviously capable of the clearest demonstration.

Theoretic chemical reasoning will throw a great deal of light upon this point, which we shall presently see confirmed by the practical experience of others, and finally by direct experiment made by myself upon this somewhat vexed question, as to the policy of washing gas.

Dr. Letheby explained to his audience in detail the properties of all the illuminating constituents of coal gas. He thus alluded to marsh gas, olefiant gas, or elayl, propylene, butylene, acetylene, &c.; and in speaking of their properties he mentioned the fact that they were all of them, to some extent, soluble in—that is, capable of absorption by—water. How he can reconcile this statement with those I have quoted above, it is hard, I think, to discover. We are told that the use of the wash vessel attached to the hydraulic main, which was very generally employed a few years ago, has been abolished, because, when used, a large proportion of hydrocarbons were retained there, to the serious detriment of the light-furnishing power of the gas.* It is within my memory that, more than a year ago, I stated in one of my communications to this Journal (I have not means of access to the number at this moment) that 13-candle gas allowed to bubble through a column of water of moderate height, suffered deterioration to the extent that it became less than 8 candles of illuminating value. I have caused the following experiment to be made, as further proving this point, and, for explanation, reference to the engraving at page 569 is necessary. The gasholder F was filled with ordinary coal gas, and likewise gasholder B. A small fountain nozzle was attached to the inside of the gasholder, at the end of the small inlet-tube *f*, by joining the water supply-tap H′ to the tap *f*, and then cautiously turning on the tap H′. A fountain of water was thus caused to play amidst the gas, and which being projected inside with considerable force, struck against the roof of the gasholder F, about the part G, by which the gas was thoroughly exposed to the action of a very finely divided rain, as it fell into the receiver F′ below. The illuminating power of the gas remaining in the gasholder F after this washing was compared with that of the gasholder B. The deterioration of the illuminating value after half an hour's play of the fountain, was nearly 33 per cent., the gas (similar to that stored in gasholder B) having 14 candles value before applying the washing operation. But the action of water must necessarily be variable in this respect, because we know that there is a considerable difference in the nature and properties of the hydrocarbon illuminants; and that whilst much mischief would be caused by washing some gases, (for instance, if they contained much propylene, which is freely soluble in water), with another, which, on the other hand, might contain much butylene, considerably less harm would result from its application. Enough has, I believe, now been said to deter practical gas-makers from any indiscriminate use of washing processes in gas-works.

In the inquiries which I have instituted to ascertain whether it is possible to remove a part or the whole of the sulpho-hydrocarbons WITHOUT injuring the illuminating power of the gas, I have been so fortunate as to obtain permission to make the necessary experiments upon this subject in the works of the Taunton Gaslight and Coke Company. To Mr. Fisher, their secretary and manager, and his assistants, to the general excellent arrangement of the gas-producing apparatus, and the close attention paid to the great cleanliness rigidly observed throughout these works, I shall be almost entirely indebted for the means through which the elucidation of this subject will be effected. The gas made here annually now amounts to nearly 24 millions of cubic feet. After leaving the condensers it passes into a cast-iron scrubber of the form of the drawing below. This scrubber, A, is 12 feet in height and 5 feet in diameter; at *b′ b″ b‴* are placed three iron trays,



* "Treatise on Gas-Works," 2nd Ed. Virtue and Co. 1865.

each in separate parts, upon which pieces of coke are placed, as sketched in the drawing, where a part of the interior is shown at *p p p p*; *c' c'' c''' c''''* are man-holes, for allowing access to the interior of the vessel, and which are, of course, very carefully luted when the vessel is ready charged for use. B is a cast-iron tank, into which the ammoniacal liquor is pumped, as may be necessary, for the supply that passes to the interior of the scrubber by the pipe *e* to the star-formed arrangement of $\frac{3}{4}$-inch pipe *f f'*. This star-formed pipe is perforated watering-pot fashion, and it is therefore pretty full of small holes. A more or less flow of ammoniacal liquor from this rose consequently trickling in every direction on to the coke upon the trays below, it is obvious it will be susceptible of ready regulation by means of the tap *d*. Now it will be seen by a momentary glance that the gas as it enters by the inlet-pipe indicated by the arrow *k* cannot fail to come into complete contact with the ammoniacal liquor which is thus kept continually trickling over the coke pieces to the bottom of the "scrubber," from where the liquor passes to a receiving-vessel sunk into the ground, to be returned as desired again to the tank B to supply the scrubber for after use in the same way. The ammoniacal liquor, which is used over and over again at these works, is of a dark sherry colour, smells very offensively of sulphuretted hydrogen, with an after ammoniacal odour, and, in fact, possesses all the characteristics of the sulphide of ammonium solution which is prepared for laboratory purposes. I have never, but upon one occasion, detected the least trace of ammonia in the gas sent out by this company, notwithstanding that I have very frequently had opportunities of examining it. This, I believe, is due to the uniform presence of an excess of sulphuretted hydrogen in the liquor of the scrubber, by which the ammonia of the gas as it reaches that vessel is promptly combined with that acid, and there effectually retained.

Whilst the experiments now about to be detailed were being made, a fixed number of retorts were regularly charged with one uniform mixture of coal,* so as to ensure as far as possible that the gas so obtained should be of a very average quality. A gasholder had been prepared for the reception of a part of this gas, which, while passed as usual through the purifiers, &c., was not, however, allowed to continue its ordinary course through the scrubbing-vessel, but was diverted therefrom by transit through a side-channel. A few thousand cubic feet of this unscrubbed gas were collected in the gasholder; 7 cubic feet of it burned with a Leslie's burner and two receivers; the solution was concentrated, acidified with nitric acid, and precipitated with chloride of barium, with all the precautions described in my last paper, gave the results appended below—where they are placed for convenience of comparison with others obtained by experiments with further portions of gas.

The two following experiments in the table show the effect produced by the scrubber upon gas procured from similar charges of coal, and corresponding uniformity in working. I should explain, however, that the arrangements for delivering a constant supply of liquor to this washing-vessel were not so perfect when these two experiments were performed as they are at the present moment for the stream of fluid was only thrown over the coke-packing occasionally during the 24 hours:—

Table showing the quantity of Sulphur in the form of Bisulphide of Carbon or Sulphuretted Hydrocarbons in Coal Gas, with and without exposure to the action of the Ammoniacal Liquor of the Taunton Gaslight and Coke Company, in the "Scrubber" employed at their Works.

Experiments.	Quantity of Gas Analyzed.	Whether exposed to the Action of the Liquor or not.	Weight of Sulphate of Barium obtained.	Amount of Sulphur in 100 Cubic Feet.
A ..	7 c. feet.	No.	10·1 gr. ..	19·80 gr.
B ..	7 c. feet.	Yes.	6·2 gr. ..	12·15 gr.
C ..	7 c. feet.	Yes.	7·0 gr. ..	13·7 gr.

In the next statement is shown the results of two very carefully made experiments regarding the respective illuminating powers of the same gas collected in two gasholders—one of which was "scrubbed," and the other "unscrubbed."

Mean of Ten Observations of Illuminating Power in Sperm Candles of "Scrubbed" and "Unscrubbed" Gas made at the Taunton Gas-Works.

"Scrubbed" gas gave . . . . 13·69 candles.
"Unscrubbed" gas gave . . . 14·16 „

The estimation of the amount of sulphur in the unscrubbed gas of the above 14·16 candles value is proceeding while I write these results, and, consequently, is not yet ready for publication.

The trials of photogenic power of the "scrubbed" and "unscrubbed" gases, pending further experiments, even at this somewhat early stage, strengthen very much the certainty I feel from late observation that it is quite possible to remove nearly, if not all, the bisulphide of carbon compounds of coal gas when very strong ammoniacal liquor containing excess of sulphuretted hydrogen is employed in the "scrubber," *without injuring the illuminating power* of the gas.

(*To be continued.*)

* Equal parts of "Energlyn" and "Parkfield."

Correspondence.

CONSTANT WATER SUPPLY.

SIR,—Until the publication, in your impression of the 19th inst., of Mr. Quick's report to the Southwark and Vauxhall Water Company, it was thought by many that the question of constant *versus* intermittent supply had long since been settled in favour of the former, and that time only was required to effect the change and make the constant supply universal.

A few facts will carry greater conviction than any running comment one might feel induced to make on that report, on the reading of which the question which suggests itself is, is the principle so thoroughly condemned at fault, or are not all the evils complained of to be found in the injudicious manner of carrying it out? I believe in the latter, and to think otherwise would be a reflection on the mechanical genius of the age. And I cannot conceive, with the appliances already at hand, why the constant supply should not be quite as safe and inexpensive (if properly managed) as the intermittent.

If a town of 25,000 inhabitants, having a pressure on the pipes varying from 104 lbs. to 87 lbs. per square inch, can keep up a constant supply with 17 gallons per head per day, how is it that a town of 50,000 inhabitants similarly situated, by extending the same means, cannot be kept within the same bounds? And if 50,000, why not any greater number, *ad infinitum*?

Some years since a change took place in the management of a concern, the engines of which were kept working 120 hours per week. In about five weeks it was reduced to 80 hours, and in a short time 30 per cent. was added to the receipts without increasing the expenditure, and the dividends raised from 4 to 7 per cent. Taking the average consumption in this city for the last five years, I find it to be 16·82 gallons per head per day per individual supplied, and 81·24 gallons per house, including in this consumption the watering the streets, supply to breweries, malt-kilns, mills, laundries, railway stations, &c. If the quantity be distributed over the entire houses and total population, the average is 58 gallons per house and 12 gallons per head per day.

Having noticed a great difference in the cleanliness and comfort in some groups of cottages compared with others quite the reverse, meters were attached to two groups, one of 9, the other of 13 houses similarly tenanted, to ascertain the greater quantity required to keep up this neat and healthy appearance. At the end of three months it was found that the 9 clean houses had used 17 gallons per house per day, whilst the others had used 45·4 gallons per house. Thinking the meters might be at fault, they were changed from one group to the other without in the least altering the result. The inference is, that it is not the superabundant supply, but the judicious use that imparts health and comfort. In whatever light the above quantities per head are viewed, it will be seen, by the constant supply in this city, the quantity per head is far below the 30 gallons per head intermittent supply mentioned in Mr. Quick's report.

Another comparison might be made in the per centage the total working expenses bears to the receipts, or the total cost per million gallons supplied.

Another great mistake made by many companies is that the article dealt in is only water, and that any ordinary person can manage it, and thus may be found persons in charge of large responsibilities who are quite unfit to perform the duties imposed; hundreds of pounds are thus annually lost, and the principle and not the management is blamed.

Were it not for trespassing at too great a length on your patience, a variety of incidents might be given of the waste of water, its detection, and remedy.

Also, I might say, the more than wilful waste in the cost of pumping, which must not only be seen but clearly understood to be believed.

HY. TEAGUE.

Lincoln Water-Works, Sept. 26, 1865.

REGULATORS *VERSUS* DOUBLE TAPS FOR PUBLIC LIGHTS.

SIR,—In your notice of the revision of Mr. Hughes's "Treatise on Gas-Works," you refer to my having omitted to mention the "double tap," employed by that gentleman for public lights. This omission arose simply from the little importance I attach to the instrument, and with your permission I will give my reasons for entertaining that opinion.

As most of your readers are aware, the object of one of the taps is to check permanently the supply of gas, it being so adjusted that its orifice is merely sufficient for the passage of a certain quantity under a certain pressure. It follows, therefore, that any variation in the pressure of the gas in the main, must cause the tap to become ineffective as a regulator, and under some conditions to be worse than useless.

In all well-managed gas-works, the pressure in the district varies during the hours of lighting; it must, therefore, be palpable to every one, that a fixed orifice can never regulate or control a varying pressure; and, although it may check the supply at a high pressure, it likewise offers the very serious inconvenience of obstructing the passage of the gas under opposite conditions.

To illustrate this, let us take as an example a district where the maximum pressure at the time of lighting is 20/10ths, and the minimum from midnight to sunrise 5/10ths. Now, if the gauge-tap be so adjusted as to deliver 5 feet per hour in the first case, after midnight, when the pressure would be reduced, each burner could only consume about 2¼ feet per hour, a degree of irregularity which would undoubtedly be very unsatisfactory. There is another difficulty arising from the diminished light yielded by the smaller consumption, for if 5 feet give the light of 12 candles, 2¼ feet will not give 5 candles, according to the theoretical proportion, but only about 3 candles, so that about 40 per cent. of the available light is entirely lost by the diminished supply; consequently, the district that might be well lighted during the early part of the night would be in comparative obscurity after midnight.

It is sometimes asserted that much light is not required to be given by public lamps after midnight; this may be a matter of opinion, but as darkness facilitates crime, and light prevents it, it is of the utmost importance that our streets and places should be well illuminated during the night. But if it becomes a question of economy, the proper and most sensible way to effect it would be to extinguish a portion of the lamps, leaving the others with the full average flames, whereby the full light is obtained from the gas consumed.

The double tap was used many years ago in France, and in some parts of England, but since then great improvements have taken place in the distribution of gas, and one of the most important of them is the adoption of regulators—really and effectively regulators—for street-lamps. These instruments, as recently constructed, are of the greatest simplicity in form and action; they maintain, under every variation of pressure in the mains, a constant and regular consumption by the burners with that degree of precision as to render meters for street-lamps quite superfluous; moreover, the burners supplied with these instruments are so constructed as to produce the maximum of light from gas, and they are incorrodible.

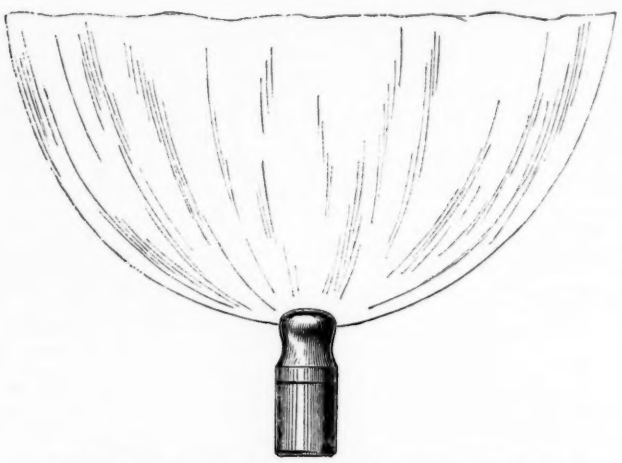
The advantages of these street-lamp regulators may be witnessed in the north of London, on the Imperial Company's district (and probably in many other places). There the flames are uniform throughout the entire night, the gas is consumed under the best conditions, and the district lighted in an admirable manner, to the entire satisfaction of the inhabitants, and without prejudice to the company. But these excellent results can only be obtained by the regulator, an apparatus that closes or opens the orifice for the passage of the gas in proportion to the increase or decrease of pressure.

I am at a loss to understand how the double tap has been termed a "regulating apparatus." It does not merit that name, as I believe I have clearly shown; and as it answers no useful purpose, it was not noticed in the revision of the work alluded to.

WM. RICHARDS.

7, Regina Road, Tollington Park, Hornsey.

READING PUBLIC LAMPS.



Full-sized diagram of the flame of a metered lamp as regulated by the double tap during the early hours of the evening of Sept. 25, 1865.

Full-sized diagram of the flame of the same metered lamp after midnight, Sept. 25, 1865.

The quantity of gas consumed by this lamp in a fortnight was 400 cubic feet, or 3·26 feet per hour for 122½ hours, which is also the average consumption of all the metered lamps for the last two weeks.

Reading, Sept. 29, 1865. J. STRACHAN, Inspector.

Register of New Patents.

3022.—RICHARD TYE, of Birmingham, in the co. of Warwick, manufacturer, for "*Improvements in sliding gaseliers, gas-pendants, and gas-lamps.*" Patent dated Dec. 5, 1864.

This invention consists first of certain arrangements of the parts of sliding gaseliers for the purpose of preventing the falling of the moving parts of the said gaseliers in case of the breaking of the chains. The interior of the slide of the gaselier is the same as the ordinary water-slide, these improvements applying to the exterior parts only. The balance-weights of the gaseliers are free to slide on tubes or rods attached to a bridge crossing the pulley-frame. At the bottom of each tube or rod is fixed a pan or weight-receiver, not connected with the outside tube of the slide, and made of such a shape that it will miss all ornaments or parts affixed to the outside tube. Below the weight-receivers and near the vase part of the gaselier is a fixed canopy, soldered or screwed firmly upon the outside tube, the said canopy carrying three wires or rods, which slide inside the tubes on which the balance-weights work. The object of these rods is to steady the tubes upon which such balance-weights work. This part of the gaselier may be modified in the following way; that is to say, by fixing the bridge on the under part of the pulley-frame in an opposite position to that on the upper part, and by using, instead of square tubes, hard-drawn cast-iron wires, similar to stair-rods. These wires are pushed tightly through the bottom bridge, and screwed into the top bridge, which makes them quite steady, so that they only require the weight-receivers at the bottom. The water-cup has strong round rings attached to it, through which the weights can pass without contact. The chains are attached to the upper edge of the said rings or to the water-cup, and pass over the wheels inwards or outwards as in the ordinary slide, and descending close to the tubes or wires, are fastened to the weights.

The invention consists secondly of constructing or arranging the parts of a safety ball-valve for sliding gaseliers, which consists of two hollow parts screwed together, the upper part being screwed to an ordinary socket at the ceiling of the room. In the interior of the lower part of the ball-joint, and working gas-tight therein, is a half ball, connected by a tail-piece to the slide of the gaselier or pendant. A square shoulder in the middle of the top of the half ball projects into the interior of the ball-joint. In the interior of the upper part of the ball-joint is a bucket-shaped hollow plug, working gas-tight in the said part. In the side of the said hollow plug a hole or opening is made, communicating with the interior of the said plug, and in one side of the interior of the ball-joint in which the plug works a passage or channel is made. By turning the hollow plug in one or other direction, the hole in its side can either be made to coincide with the channel in the ball-joint or the said hole in the plug closed by being turned from the said channel. From the bottom of the hollow plug a pin passes, terminated by a square head corresponding in size with the square shoulder on the top of the half ball in the lower part of the ball-joint. A perforated plate is supported on the head of the said pin. The upper square shoulder on the half ball and the square head on the pin last described are connected by a square coiled spring fitting on the said parts. By this arrangement rotary motion of the half ball is communicated to the hollow plug, and the half ball at the same time allowed to swing freely in the fixed part of the joint.

The third part of the invention consists of an arrangement of the parts of glass-holders for enabling the glass or globe of gaseliers, pendants, and gas-lamps to be readily raised from the burner for lighting the same. Upon the burner is placed a metal support, by preference triangular, connected thereto by screws or otherwise. The termination of each of the radial arms of the triangular piece or support carries a fixed rod or wire. On the one side of the gallery or glass-holder in which the glass or globe is supported and fixed, three projecting pieces or radial brackets are made. Through holes in these brackets the three vertical rods or wires on the burner slide. By lifting the gallery or glass-holder, it slides upon the vertical rods or wires, and exposes the burner, when the gas can be lighted. After lighting the gas the gallery or glass-holder is lowered on to the burner, when the glass or globe surrounds the flame.

3030.—Thomas Atkins, of 62, Fleet Street, in the City of London, and Belle Vue House, Chepstow, in the co. of Monmouth, civil and gas engineer, for "*Combining apparatus used for regulating, adjusting, and indicating the supply and flow of hydrocarbon and other gases and vapours, with improved apparatus for effecting the perfect combination and purification of such gases and vapours for illuminating and other purposes; and for improvements in the construction of the apparatus for effecting the same.*" Provisional protection only obtained. Dated Dec. 6, 1864.

This invention has for its objects and use—

1. Combining, working at one time, and in conjunction, of apparatus for regulating, adjusting, and indicating the supply and flow of gas and vapours, with improved apparatus for carburetting such gas and vapours, for illuminating and other purposes, by means of hydrocarbon oils, or other fluids of a like character, either in gas-mains, or apparatus, or pipes, during the progress of such gas or vapours from the generator to the burner.

2. The constructing of the apparatus employed, consisting of one or more vessels and cylinders made in metal, wood, or other material, in such a manner as when placed and secured shall offer abundant surface for evaporative purposes, and be capable of being multiplied after the same plan to suit apparatus of any larger capacity.

3. The arrangement of one or more cones, moveable or otherwise, to remain either stationary or to rotate, and made of metal, glass, or wood, termed a "polarizer," so constructed and placed as to operate in diverting the course of the gases or vapours; also by an agitating motion to equalize the quality of the liquid used in the apparatus, and to effect a perfect saturation of the gases and vapours coming in contact with the exposed surface, which surface may be composed of moulded carbon, perforated metal, wick cotton, wool, or fibrous material, either separately or in combination.

4. The introduction of ready means for changing, removing, cleansing, and repairing both the internal and external portions of the apparatus with safety and economy, also for securing the further efficiency of the apparatus by means of a hydraulic dip-joint, lined with india-rubber or other soft or fibrous material to prevent escape of the gases or vapours used therein, when the apparatus is in action or out of action.

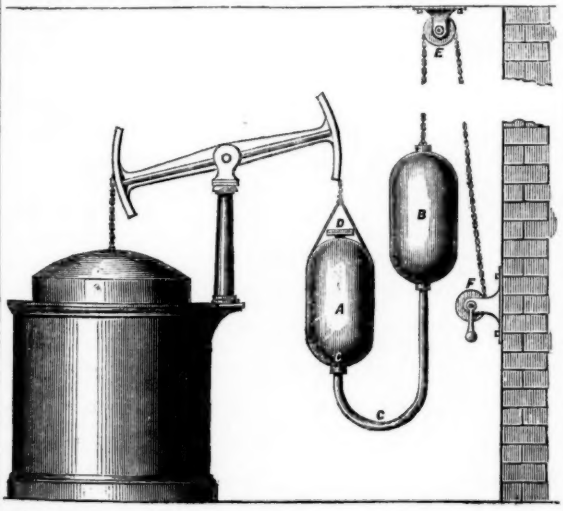
5. The adoption of philosophical self-acting and compensating contrivances attached, either separately or combined, to the apparatus, for determining the pressure, density, and specific gravity of the materials connected therewith, to ensure economy and perfect combustion; also of an arrangement for passing the carburetted air or gas through a purifying medium before leaving the apparatus.

Lastly, by inducing pneumatic and hydrostatic arrangements to cause a regular diffusion of hydrocarbon oils or other fluids of like character into and amongst gases or vapours stored or passing through gas-mains or vessels or apparatus connected therewith, in any place or position.

The inventor claims the construction and use of a combined apparatus, in which the gas or air to be carburetted is first admitted by a regulator or governor; secondly, is increased in illuminating power by a process of carburetting; and third, is freed from non-illuminating products by purification. He claims also the use of storeage vessels as part of the apparatus for replenishing the liquid without stopping the apparatus altogether; with all appurtenant improvements and arrangements employed for the purpose of effecting the objects desired.

3039.—John Keeling, late of Aldershot, in the co. of Hampshire, but now of 12, Bermondsey New Road, London, for "*Improvements in apparatus for regulating the supply of gas.*" Patent dated Dec. 6, 1864.

These improvements consist in the mode of increasing or diminishing the weight used to counterpoise the gasholder of an ordinary station governor, and by means of which the change from one pressure to another may be made to extend over many hours, or it may be effected in a few minutes without the disadvantage of too sudden variations, so liable to occur when adding to or subtracting from the weights commonly used.



The apparatus consists of a hollow vessel made of tin plate, sheet copper, or other suitable metal or material, marked A on the drawing annexed hereto, attached to the balance-beam, H, of the governor. Another hollow vessel, B, of similar size, form, and construction (but not necessarily so), is suspended from the ceiling or roof of the governor-house by means of a rope or chain, which passes over a pulley, E, and thence to a small windlass, F, to which a ratchet and click are appended. The two vessels A and B communicate with each other by means of a flexible tube, G, one end of which is fastened to an orifice at the bottom of one vessel, and the other end is attached to an orifice formed at the bottom of the other vessel. The two vessels are partially filled with water, and when it is deemed expedient to increase the pressure at the outlet of the governor, all that is necessary is to lower the vessel B below the level of the vessel A, whereupon the water from A will pass into B, and thus lighten the counterpoise to the gasholder, which, acting upon the conical governor-valve beneath it, will open the passage for the gas, and give an increased pressure. If, on the contrary, it is desired to diminish the pressure of the gas, then all that is requisite is that the vessel B shall be raised above the level of A, upon which the water from B will pass into A, increase the weight of the counterpoise, and thus operate upon the governor-valve in a proportionate degree. In order to regulate the speed with which the change from one pressure to another is effected, a valve is inserted internally at the point C of the vessel A, the graduated scale and means of actuating the said valve being seen at D. This valve may be made of different forms, or inserted at different points of communication between the two vessels, or it may be attached to the vessel B. By the extent to which this valve is either open or closed, the water in one vessel will flow into the other quickly or slowly, thereby increasing or diminishing the pressure of the gas in any given time almost imperceptibly, or, in the event of emergency, with great rapidity.

A modification of the foregoing arrangement may be made applicable to governors which have no balance-beam, by constructing the top of the gasholder of such form, and in such manner, as shall permit of its containing water, and taking the part of the vessel A; or a separate vessel may be made and attached to the crown of the gasholder. These modifications are, however, so simple, that it is not necessary to illustrate them.

The claim is for the construction of apparatus for regulating the supply of gas substantially as described.

3042.—George Tomlinson Bousfield, of Loughborough Park, Brixton, in the co. of Surrey, for "*Improvements in the manufacture of illuminating gas.*" A communication. Patent dated Dec. 6, 1864.

In the process of gas-making directly from coal as ordinarily practised, two operations are effected in the retort—the first, which, for the sake of distinction, may be called distillation, consisting mainly in the transmutation of certain of the constituents of the coal into oily vapours containing too great a proportion of carbon to constitute illuminating gas; and the second consisting in the change of the combination of the chemical constituents of these vapours, whereby illuminating gas is produced, accompanied by a deposition of a portion of the carbon.

The objects of the present invention are to reduce the loss in carbon incurred in the common process, and to effect the combination of all the hydrogen existing in the coal with the carbon thereof in the form of illuminating gas; also, at the same operation, to produce an illuminating gas of higher illuminating power than is generally produced at gas-works.

To this end the invention comprises a new process of gas-making, consisting of two parts, one or both of which may be used as deemed expedient. The first part of the invention consists of the process of distilling the coal or other gas stock in a retort distinct and separate from that in which the gas-making is effected, and which is heated to a lower temperature than that at which the retorts for the manufacture of illuminating gas from coal are maintained, and then passing the products of distillation without condensation into a retort heated to a high temperature, in which they are transferred into illuminating gas in the presence of metallic zinc, or other material capable of absorbing and fixing the oxygen contained in the vapour of water, and carbonic acid and carbonic oxide at a high temperature, so that the vapour of water passing from the gas-works during the operation of distillation is decomposed during the operation of gas-making, the oxygen being eliminated and fixed in a compound which cannot mix mechanically with the illuminating gas, and the hydrogen being put in a condition to combine with a portion of the carbon of the oily vapours in the form of illuminating gas; or, in other words, being rendered available for gas-making, and also that the oxygen may be eliminated from the carbonic acid and carbonic oxide, and the carbon thereof put in a condition to combine with the hydrogen in the form of illuminating gas; the result of this process being the utilization for gas-making of portions of the carbon and hydrogen which would otherwise be lost for that purpose, and the production of a much larger amount of illuminating gas than could be produced if a portion of the hydrogen of the gas stock was permitted to escape in combination with the oxygen, in the form of water, and portions of the carbon in combination with oxygen, in the form of carbonic acid and carbonic oxide.

The second part of the invention consists in the process of effecting the distillation of the gas stock in one retort, and the gas-making of the product in another retort, in the presence of an additional quantity of steam to that obtained from the distillation of the coal, and of a material which will decompose water at a high temperature, whereby all the hydrogen existing in the gas stock is not only rendered available for gas-making, but an additional quantity is derived from the additional steam introduced sufficient to transmute the surplus carbon produced in gas-making into illuminating gas.

The introduction of steam is best effected during the distilling process, so that it becomes highly heated and thoroughly intermingled with the products of the distillation of the coal before it enters the gas-making retort. Its introduction during the distilling process is useful also in another respect. It is a well-known fact that any vapour arising from or through a substance undergoing distillation tends to carry with it the vapours of other vaporizable constituents of the substance; hence the introduction of the steam into the distilling retort, instead of directly into the gas-making retort, facilitates the separation of the oily vapours from the gas stock and their transmission from the distilling retort to the gas-making retort.

The claims are—

1. The process set forth of manufacturing illuminating gas by distilling the gas stock in one retort, and converting the volatile product of the distillation into illuminating gas in another retort, in the presence of a

material which, when at a high temperature, will absorb and fix the oxygen contained in the volatile product of the distillation.

2. The process set forth of manufacturing illuminating gas by distilling the gas stock in one retort, and converting the volatile product of the distillation into illuminating gas in another retort, in the presence of an additional quantity of steam to that obtained from the gas stock, and of a material which will absorb and fix the oxygen contained in the volatile product of the distillation and in the additional steam.

3044.—Matthew Piers Watt Boulton, of Tew Park, Oxfordshire, Esq., for "*Improvements in obtaining motive power from aëriform fluids and from liquids.*" Provisional protection only obtained. Dated Dec. 6, 1864.

This invention has for its object more particularly, to enable the heat produced by combustion to be utilized in the production of motive power through a greater range of temperature than is now done, in order that a larger proportion of the heat may be converted into mechanical effect. When it is required to raise the aëriform fluid to a high heat under pressure in a vessel, it is desirable that the heat should not be imparted to it from the outside of the vessel, as in this case the tenacity of the metal forming the vessel is impaired. The heat may be imparted to the fluid by injecting into the vessel some substance in a state of fusion. For this purpose metals may be employed; also combinations of metals with non-metallic elements, such as metallic oxides, chlorides, fluorides, carbonates, silicates, borates, and mixtures of these substances. The heated products of combustion issuing from the furnace employed to keep these materials in a state of fusion may be used to generate steam in a boiler, which steam may be used for the production of motive power. Steam may be injected into a vessel in which heated matter of the above-mentioned nature is injected, and the steam so heated may be used for the production of motive power.

3059.—Edward Myers, of Millbank Row, Westminster, in the co. of Middlesex, C.E., for "*Improvements in wet gas-meters.*" Patent dated Dec. 8, 1864.

This invention relates to improvements in the arrangement of overflow and air tubes for maintaining the proper level of water in the measuring-drums of wet gas-meters, and also to prevent the passage of unmeasured gas through the waste water-chamber. For this purpose, in place of employing separate tubes for the water overflow, and employing air passages for maintaining the level of the water in wet gas-meters, as was described in the specification of a patent granted to W. Esson, the 27th of August, 1855 (No. 1942), and also in the specification of a patent granted to the present patentee and W. R. Williams, on the 24th June, 1863 (No. 1592), the construction is simplified by forming or combining the overflow and air passages in one tube, which tube connects the water-reservoir and waste water-chamber together, the stuffing-boxes through which it passes into those chambers being formed with cup leathers for the tube to slide up and down through, in order to adjust the capacity of the meter and level of the water therein. A wire is fixed or soldered on the tube, and passes up through the meter to regulate the position of the overflow-passage as desired. The air passage to the reservoir is formed by a division (by preference inclined) fixed in the tube, an opening for the admission of air upwards being formed at the water-level. Just below this opening a lip or short branch is applied to form the opening for the overflow to the waste chamber. In place of having a division in the waste water-chamber, the waste is conducted by a pipe or tube to the bottom of the waste water-chamber, and when the waste water rises to a certain level it passes down a V-shaped overflow-tube connected to the discharge orifice. Shields are applied to protect the inlet and outlet passages of wet gas-meters, so as to prevent any fraudulent tampering with the internal parts of the meters. These shields consist, by preference, of metallic plates or surfaces surrounding the inlet and outlet passages within the case of the meter, to prevent the introduction of any instrument into the interior thereof. Suitable openings or perforations are formed in such shields for the passage of the gas.

3091.—Joseph Barnsley, of Coombs Wood Tube-Works, in the parish of Hales Owen, in the co. of Worcester, metal tube manufacturer, for "*Improvements in the manufacture of solid and seamless metal tubes, gun-barrels, and artillery, and for machinery to be used in the same.*" Provisional protection only obtained. Dated Dec. 14, 1864.

In carrying out these improvements, it is proposed to take a hollow bloom of iron of the required size from the heating furnaces, and pass it through two or more pairs of iron or steel rolls, grooved suitably to the exterior of the tube, gun-barrel, or cannon intended to be made. Each pair of rolls is placed behind the other in a successive line, at such distances apart as to allow the tube, gun-barrel, or cannon to leave the preceding pair of rolls before it enters the next pair of rolls, and go on throughout the whole train of rolls. A solid bar of steel is passed through the whole train of rolls, and such bar is secured to a back stand or support by a moveable screw. Upon such bar, and in the centre of each pair of rolls, is fixed an egg-shaped mandrel, of the size proportioned to the inner diameter of the tube, gun-barrel, or cannon to be made. The bar is kept in the centre of the train of rolls by self-adjusting vertical bars or supports, each working upon a shaft, so as to allow the tube, gun-barrel, or cannon to pass along the entire length of the bar, and through each pair of rolls in succession, and to return to the supporting position immediately the tube, gun-barrel, or cannon in process of manufacture has passed beyond it. The finished tube, gun-barrel, or cannon is disengaged from the bar by a hinge or joint placed in the bar behind the last pair of rolls.

3115.—William Bardwell, C.E., of 4, Great Queen Street, Westminster, for "*An improved method of utilizing sewage and urine, and for facilitating their passage through pipes, thereby preventing the pollution of rivers and streams.*" Patent dated Dec. 16, 1864.

The sewage is taken from its outfall or some other place to sewage works through a pipe or culvert by pumping or by gravitation alternately with the sewage used for irrigation in its normal state. When or where it is preferred to use sewage in its normal state sulphate of lime (burnt gypsum), commonly called plaster of Paris, by preference that made from the gypsum of France, Belgium, Norway, or Spain, is made into a hydrosulphate of lime, and allowed to run with the sewage into the supply basin or bowl, in the proportion of half a ton or more to a million gallons of sewage, or the sulphate of lime may be sifted in a dry form in like proportions over the sewage in the tank. From the supply basin or pipe the sewage rushes into a mixing-bowl in such a manner as to produce centrifugal motion, by which the sewage and the deodorants become thoroughly intermixed in their passage to the depositing tanks in which is placed, on a grate of galvanized iron, a rapid filtering-bed of gravel or sand, through which the liquid percolates and runs into a clear water reservoir, leaving behind the solid matters.

The urine is received into a tank either beneath or on one side of the public urinals, and taken from thence to a laboratory, where it is treated according to its dilution with a sufficient quantity of sulphuric acid or other mineral to fix the ammonia. It may then be evaporated to any required strength and the acids neutralized, and be used for dyeing and other purposes, or converted into a dry and friable compound by the admixture of sulphate of lime, and then added to the sewage deposit or sold separately.

3120.—George Brown, of Poole, in the co. of Dorset, mechanic, for "*An improvement in the construction of cylinders used in the manufacture of articles of pottery, such as pipes, tiles, hollow bricks, and the like.*" Provisional protection only obtained. Dated Dec. 16, 1864.

Hitherto the cylinders through which the clay or other plastic substance passes after leaving the pug-mill, and prior to its being manufactured into pipes, tiles, hollow bricks, or other articles, have been formed with an even or smooth surface. This invention consists in forming the internal surface of the cylinders, and through which the clay passes, with a series of ribs, grooves, or projections, set by preference in a spiral form, and arranged at distances apart, according to the quality of the clay that is under treatment. By fitting or making the cylinders with ribs, grooves, or projections in this manner, the clay is driven or forced through the cylinder by the ordinary screw with much greater facility and effect than when the surface of the cylinder is smooth.

3121.—James White, of 45, High East Street, Dorchester, for "*Improvements in closets and commodes.*" Patent dated Dec. 16, 1864.

In a closet constructed according to this invention (which has reference to a previous patent, No. 1316, May 28, 1860), the receptacle below the earthenware pan consists of a trough of cast iron or stoneware, or of any other suitable material. This trough may be of a cylindrical or oval form, but partly or wholly open at the top, and closed at one or both ends, an outlet being provided either through one of the ends or at the bottom near one of them. In this trough are made to rotate one, two, or more spindles or axles, on which projecting blades or similar contrivances are so fixed as to form a screw or screws, and at the same time act when rotating as stirrers or mixers. To the inner surface of the trough or cylinder are attached blades of a similar character to those fixed to the spindles, and placed alternately with them. At the back of and above the seat is provided a receptacle or reservoir containing a quantity of dry earth, at the lower part of which is placed a roller or spindle, provided with two or more longitudinal ribs or plates, and made to rotate horizontally in a chamber or cylinder open top and bottom, the upper part of which is in direct communication with the reservoir of dry earth. By causing this roller to revolve one or more quarter circles, a quantity of earth contained between two or more of the same ribs is discharged through the lower opening and into the trough below on to the excrementitious matter. Suitable gear-work is provided, which, on turning the winch-handle, causes the screw or mixer to revolve, and also the measured quantity of earth to be discharged.

3127.—John Garrett Tongue, of the firm of Tongue and Birkbeck, of 34, Southampton Buildings, Chancery Lane, in the co. of Middlesex, for "*Improvements in pneumatic apparatus for raising and drawing off liquids and gas.*" A communication. Provisional protection only obtained. Dated Dec. 17, 1864.

This invention relates to the application of pneumatic apparatus in combination with a syphon and an air-pump. The apparatus is portable, very simple in construction, and easily worked, for the purpose of drawing off liquids without exposing them to deterioration by coming in contact with atmospheric air or other deteriorating agents.

3134.—Richard Archibald Brooman, of 166, Fleet Street, in the City of London, for "*An improved liquid-meter.*" A communication. Patent dated Dec. 17, 1864.

In this meter the quantity of water is measured not by its pressure, as in ordinary meters, but by its flow. In order that the indicating needle may make one turn, it is necessary that four compartments should have been emptied of (say) half a pint; therefore one rotation of the needle indicates one quart passed through the meter. The flow through the meter, whether at high or low pressure, may take place rapidly or slowly, by driblets or in a continuous stream, and that without affecting the correct quantity indicated. There are five special features intended. First, for the inlet and outlet of the liquid; second, for the distribution of the liquid; third, for the expulsion of any excess of air in the meter; fourth, for maintaining in equilibrium the pressure of the air and liquid, whereby the meter works as well at low as at high pressures; fifth, for showing, by the indicating needle the work of the meter.

3145.—Charles Wyatt Orford, of New Street, Birmingham, in the co. of Warwick, architect and engineer, for "*An apparatus for measuring water and other fluids at either high or low pressure.*" Patent dated Dec. 19, 1864.

This invention consists in the use of a rolling weight as a motive power for turning the taps or cocks of water-meters; second, the use of a piston or float moving freely upon the piston-rod until such time as checked by tappets or other appliances thereto attached. The advantages of this arrangement are that by its use all and every portion of water or other fluid passing through the apparatus is most correctly measured, the exact amount being shown by the index attached.

3146.—Sir John Gray, knight, of Charleville House, in the co. of Dublin, Ireland, for "*Improved taps or cocks for regulating the flow*

of water into, through, or from cisterns, pipes, and other receptacles or conduits." Patent dated Dec. 10, 1864.

According to this invention the taps or cocks are constructed with two valves, one the discharge-valve, the other the inlet-valve, which latter is also under certain conditions capable of acting as a check or stop valve for the purpose of shutting off the water from the discharge-valve during examination or repair. Each of these valves is closed by the pressure of the water forcing the disc of the valve down upon its seat—an arrangement common to many valves now in use. The inlet-valve may, by this invention, be converted into a check or stop valve by the mere act of removing the cover of the body of the tap or cock for the purpose of examining or repairing the discharge-valve, and its appurtenances.

3160.—Henry Bird, of 1, Berkeley Street, Cheltenham, in the co. of Gloucester, physician and surgeon of the Royal Colleges of London, for "*Improvements in treating sewage matters.*" Patent dated Dec. 20, 1864.

This invention consists first in combining a compound called sulphated clay with sewage waters or matters, by which the organic matters therein are deodorized, the ammonia fixed, and when permitted the organic matters are precipitated with the clay, leaving the water pure, or comparatively pure. The invention further consists in combining sulphuric acid or sulphated clay with the precipitated matters, in order to render them more suitable for manure.

3169.—Michael Henry, of 84, Fleet Street, in the City of London, for "*Improvements in governors.*" A communication. Patent dated Dec. 21, 1864.

This invention, which consists mainly in improvements in a patent obtained by W. Clark, as a communication from Léon Foucault, No. 3479, Dec. 30, 1862, has for its object the construction of governors for regulating or governing steam or other motive-power engines. The improvements refer to that class of governors which work centrifugally, and they consist in combining all necessary conditions for obtaining a complete isochronic action, the details of which would occupy too much space.

3171.—John Ramsbottom and Thomas Blackburn, both of Blackburn, in the co. of Lancaster, hydraulic engineers, for "*Improvements in the construction of hydraulic and other engines for obtaining motive power, and for compressing and measuring fluids.*" Patent dated Dec. 21, 1864.

Although these improvements are mainly intended to utilize the columnar pressure of water obtained from elevated sources of supply, they are equally applicable to and form a very cheap, portable, and compact engine or pump, if driven by fluids or vapours obtained from other sources. In ordinary engines of this nature, in consequence of the comparative low velocity of water compared with that of elastic fluids, a high motion has not been readily obtainable except at the expense of excessively large valves and port-ways, the pressure and counteraction of which has thus absorbed a high per centage of the motive power. These improvements comprise such an arrangement and combination of parts, as well as new features, as will enable the patentees to obtain high velocities, greater freedom from counteraction, and a compact as well as economical machine, well adapted for extending advantageously the use of water in motive-power engines

3182.—James Byrne, of Dublin, in the co. of Dublin, in Ireland, for "*Improvements in governors.*" Patent dated Dec. 22, 1864.

This invention consists of an adjustive governor applicable to steam and other motive-power engines and machinery; and the principle upon which it is based is that the centrifugal force of balls at the extremities of the revolving pendulum is equilibriated at any required speed by the force of gravity of an adjustable counter-weight, or the tension of a spring, by which means a valve may be actuated or machinery controlled.

3185.—James Gillespie, of Garnkirk, Lanarkshire, manager, Garnkirk Fireclay Company, for "*The improved construction and manufacture of retorts, crucibles, glasshouse-pots, and other similar vessels, and in the means and apparatus employed therein.*" Patent dated Dec. 22, 1864.

This invention relates to an improved method of constructing such vessels as are subject to great and constant variations of temperature when in use, and includes several minor details, means and appliances for effecting the object, the principal feature of the invention consisting in forming or constructing the whole or the greater part of the walls, sides, ends, or bodies of retorts, crucibles, glasshouse-pots, and other generally similar vessels, of two or more layers or thicknesses of whatever material they may be made with, or having thin or slight divisions, spaces, or partings between the contiguous or adjacent surfaces of such layers or thicknesses.

3213.—John Wolstenholme, of Ratcliffe, in the co. of Lancaster, plumber, glazier, and gas-fitter, for "*An improved implement for cutting pipes and bars of metal.*" Patent dated Dec. 26, 1864.

This invention consists in the cutting of pipes or bars of metal by means of a circular cutter revolving in a bush, which slides on a hooked piece of steel or other metal. The pipe or bar to be cut is securely held in a vice or otherwise, and the circumference of the cutter is brought against the pipe or bar by means of a screw passing through the lower end of the hooked piece above referred to; the implement is then turned round by the handle forming the continuation of the screw, and the cutter is set up by the turning of the screw; by this means the cutter gradually penetrates into the metal until the pipe is cut asunder, or the metal bar is sufficiently indented to enable it to be broken.

3252.—Louis Philippe Edouard Max, of Paris, in the empire of France, and 8, Upper Stamford Street, London, merchant, for "*Improvements in treating oils and hydrocarbons, and in apparatus for the same and other operations in which matters have to be purified, clarified, and refrigerated or condensed.*" Patent dated Dec. 30, 1864.

One of the improvements consists in purifying oil or other liquid by the use of sulphuric acid and soda as herein mentioned, but hot instead of cold as heretofore; and by another process the oil or other liquid is caused to flow through a series of vessels placed at different levels, by means of which the necessity for agitation is dispensed with. The refrigerating apparatus employed consists of a series of chambers, in each of which are two concentric pipes, or two pipes placed one within the other. The oil or liquid flows down the inner pipe, which is perforated at the bottom for its passage, and then passes partly up the outer one, surrounding it, whence it flows into a similar apparatus, and so on.

5.—John Frederick Parker, of Birmingham, in the co. of Warwick, commission agent, and Joseph Tanner, of Birmingham aforesaid, galvanizer of iron, for "*Improvements in the manufacture of oxygen gas, and in treating and economizing the residual products of the said manufacture.*" Patent dated Jan. 2, 1865.

In manufacturing oxygen gas according to this invention, the protoxide of calcium or quick lime is employed, which is heated to a red heat with access of air and stirred continually during the heating. By this treatment any carbonic acid or moisture which the lime may contain is expelled. Two parts by weight of the lime so prepared is taken with one part by weight of nitrate of soda, both in powder, and these are mixed well together and exposed to a bright red heat in a retort or close vessel. The result is, that a large quantity of gaseous matter consisting mainly of oxygen is evolved, and the gas so evolved is passed into a condenser supplied with water, by which any nitrous acid formed is absorbed. From this condenser the oxygen gas thus purified passes to the gasholder.

Instead of passing the gaseous products obtained by heating the mixture of nitrate of soda and lime into a condenser as last described, such products may be passed through a tube or cylinder, or other vessel, and heated to bright redness. By this treatment, any compounds of oxygen and nitrogen which may exist in the said gaseous products are wholly or mainly decomposed, and a large amount of uncombined oxygen obtained. The gas may afterwards be passed into a condenser to remove any gas which is soluble in water.

The residuum left in the retort is employed for the manufacture of a second quantity of oxygen in the following manner:—Two parts by weight of the said residuum is mixed with one part by weight of nitrate of soda, and this mixture is exposed, as before, to a bright red heat in a retort or close vessel; the nitrous acid is condensed by water, and the oxygen gas is passed to the gasholder, as before described.

The residuum left in the retort after the manufacture of the second quantity of oxygen, is treated and economized in the following manner:—The said residuum is digested in hot water, in which it is well stirred from time to time; and after allowing the insoluble portions to subside, the clear liquid is separated by decantation. This liquid consists of a solution of caustic soda; and by evaporation of the water, the caustic soda can be obtained in a solid state. The undissolved portions consist mainly of lime, which is to be mixed with the solution of nitrous acid obtained by purifying the oxygen as hereinbefore described. There is thereby obtained a compost useful as a fertilizer for cereals, and which compost is called "nitrocarbonate of lime." Or the residuum left in the retort, consisting of a mixture of caustic soda and lime, may be used by glass and soap makers. Instead of mixing the nitrate of soda with twice the weight of lime, and using the residuum after distillation in mixture with a further quantity of nitrate of soda, as described, the lime and nitrate of soda may be mixed in equal proportions; in which case the residuum is not used a second time. The residuum in this case resembles that obtained after the manufacture of the second quantity of oxygen, hereinbefore described. Although it is found in practice that the proportion of lime and nitrate of soda described answer very well, these proportions may be varied without affecting materially the results.

20.—Walter Payton, of 20, Westbourne Terrace North, Paddington, in the co. of Middlesex, for "*Improvements in means or apparatus for measuring water or other liquids.*" Patent dated Jan. 4, 1865.

In this apparatus the inlet and outlet passages are each formed double, so as to be closed by a pair of valves; the pressure of the liquid is rendered neutral, or nearly so. The chamber into which the water or other liquid passes to be measured is provided with a moveable cover, acting as a float or piston, which rises with the flowing into this chamber of the liquid to be measured, and the upper part of this chamber above the float opens into another chamber, which acts as an air-chamber, and by its having communication with the passage for the measured liquid it also acts as a reservoir of the measured liquid. The water or other liquid to be measured passes into the measuring-chamber by one pair of the equilibrium valves whilst the outlet passages from the measuring-chamber are closed, and the flowing of the liquid into the measuring-chamber causes the float to rise to a point capable of being varied or regulated, when it acts to alter the position of a balance-weight, causing that weight to change the position of the two pairs of valves, by closing the inlet-valves and opening the outlet-valves, when the liquid in the measuring-chamber will pass away therefrom, until the float in its descent again acts upon the balance-weight to cause it to reverse the position of the inlet and outlet valves, when the outlet-valves will be again closed, and the inlet-valves opened as before, and so on. A passage capable of being closed is provided for supplying air when desired to the reservoir chamber. The inventor also in some cases applies an air-vessel to the inlet-pipe to check the effect of momentum of the liquid at the change of position of the valves.

APPLICATIONS FOR LETTERS PATENT.

2372.—William Esson, of Ness House, Cheltenham, Gloucestershire, for "*Improvements in the construction of gas-meters.*" Sept. 16, 1865.

2415.—Alfred Bird, of Birmingham, Warwick, experimental and pharmaceutical chemist, for "*Improvements in purifying water.*" Sept. 21, 1865.

2419.—Charles Wyatt Orford, of Lifford, King's Norton, Worcestershire, engineer and architect, for "*A new and improved machine for the collecting and diffusing of water or other fluids.*" Sept. 22, 1865.

2435.—John Henry Johnson, of 47, Lincoln's Inn Fields, London, gentleman, for "*Improvements in generating illuminating gas, and in the machinery or apparatus employed therein.*" A communication. Sept. 23, 1865.

2439.—Alfred Vincent Newton, 66, Chancery Lane, London, me-

chanical draughtsman, for "*Improved apparatus for generating illuminating gas.* A communication. Sept. 23, 1865.

2451.—EDWARD BROOKE, the younger, of Huddersfield, Yorkshire, manufacturer of sanitary tubes and fire-clay goods, for "*An improved arrangement of apparatus and materials to be employed for effecting the deodorizing of the noxious gases arising from sewers and drains, and for the more effectual ventilation and inspection of such sewers and drains.*" Sept. 25, 1865.

2453.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*An improved construction of engine, which can be used either as a motor or for pumping.*" A communication. Sept. 25, 1865.

2465.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, London, mechanical draughtsman, for "*An improved mode of decarbonizing retorts.*" A communication. Sept. 26, 1865.

2467.—JOHN HILLIAR, of Great Cambridge Street, London, manufacturer, for "*Improvements in apparatus for ventilating and for preventing down draught in flues.*" Sept. 26, 1865.

GRANTS OF PROVISIONAL PROTECTION.

2008.—JOHN WILLIAM PERKINS, of 41, Norfolk Street, Strand, London, analytical chemist, for "*Improvements in the treatment of hydrocarbon or paraffin oils.*" Aug. 3, 1865.

2184.—EDWIN AUGUSTUS CURLEY, of 11, Amwell Street, Clerkenwell, London, mechanical engineer, for "*Improvements in appliances by means of which certain liquids, common air, and certain elastic fluids are made available in the production of light, and their quantity regulated and measured, parts of which improvements are applicable for other purposes.*" Aug. 25, 1865.

2252.—THOMAS LOMAS, of North Shields, Northumberland, alkali manufacturer, for "*Improvements in the separation of sulphide of iron from coal and carbonaceous matter.*" Sept. 1, 1865.

NOTICES TO PROCEED.

1361.—GEORGE WALTON, of Weardale Villa, the Downs, Clapton, Middlesex, for "*Improvements in apparatus used in distilling hydrocarbons.*" May 16, 1865.

1381.—GEORGE HENRY BROOKES, of Sheffield, Yorkshire, for "*Improvements in sliding gas pendants or chandeliers.* May 19, 1865.

1507.—WILLIAM CLARK, of 53, Chancery Lane, London, engineer and patent agent, for "*Improvements in the means of carburetting or treating aëriform fluids for lighting and heating purposes, and apparatus for the same.*" A communication. June 1, 1865.

1548.—HENRY HERMANN KROMSCHROEDER and JOHN FREDERICK GUSTAVE KROMSCHROEDER, both of 14, Church Row, Haverstock Hill, London, for "*Improvements in dry gas-meters.*" June 6, 1865.

1553.—JAMES HOWARTH, M.D., of Andover, Essex, Massachusetts, U.S.A., for "*An improved method and apparatus for distilling coal, shale, and other carbonaceous substances.*" A communication. June 7, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2525.—THOMAS WILLIAM COWAN, "*Improvements in the construction of portable or fixed pumps.*" Sept. 13, 1862.

2536.—EDOUARD ASTEL, "*Improvements in urinary utensils, also applicable to fixed and portable commodes.*" Sept. 16, 1862.

2542.—WILLIAM CLARK, "*Improvements in the treatment of peat and peat tar for the production or manufacture of various products, and in apparatus for the same.*" A communication. Sept. 16, 1862.

2555.—JOHN HENRY JOHNSON, "*Improvements in gas-burners.*" A communication. Sept. 17, 1862.

2560.—WILLIAM HERBERT BROWNE and HENRY ARMSTRONG, "*Improvements in dry and wet gas-meters.*" Sept. 18, 1862.

2571.—JOHN BERNHARD GIERTZ, "*Improvements in gas-burners or jets.*" Sept. 19, 1862.

Miscellaneous News.

METROPOLITAN BOARD OF WORKS.

FRIDAY, SEPT. 22.

At the Meeting of the Board this day—Sir JOHN THWAITES in the chair—

Mr. BRUSHFIELD, seeing the crowded state of the *agenda*, asked permission to postpone the motion of which he had given notice before the recess—"That the board, at the next meeting, take into consideration the subject of the terms on which gas, water, and other companies may be permitted to occupy and use the subways in the streets and public places in the metropolis, and adopt such measures thereon as may be deemed necessary." He was desirous of bringing the subject forward at the meeting of the board on that day fortnight.

The CHAIRMAN said the question was one which required much detailed information before a satisfactory conclusion could be arrived at by the board. The honourable member who had given the notice of motion would probably have to assent to a reference to a committee, as it could more conveniently be dealt with in that way than by a public discussion at the board. That being the case, it would be better at once to refer it.

Mr. BRUSHFIELD said he had no objection to that course. The reason he had given notice of a motion in the form which appeared on the paper was that, in conversation with several members, he had been told that it was almost impossible for the board to take any steps in the matter, seeing that they had no compulsory powers: and he was desirous of showing that the want of such powers was no sufficient reason for allowing the question to stand in abeyance. He would, however, adopt the suggestion of the chairman, and move—"That the whole question of the subways be referred to the Streets Committee."

Mr. LE BRETON seconded the motion.

The CHAIRMAN said, in reference to the subject of subways, he was very sorry to learn that there was likely to be an attempt on the part of one of the incorporated companies to break up the new street in Southwark, for the purpose of laying down water-pipes to supply the inhabitants. The Metropolitan Board had, at great cost, formed a subway throughout that street, and it was lamentable to find a public company, with parliamentary powers, refusing to make use of the facilities which that subway afforded, and adopting a course which was fraught with great inconvenience to the public during the progress of their works, and which in the result would destroy the paving of the street, for they all knew that, after the laying down of pipes, the roadways were never so solid and regular as beforehand. It was deeply to be regretted that the board had no power to compel these companies to adopt the subways. As it was, the companies had power, upon giving certain notice to the local board, to break up the streets at their own will.

Mr. BIDGOOD asked whether the board could not apply to the Court of Chancery for an injunction. He thought if they could show that they had provided facilities for the laying of the pipes in the subway, that the company could make use of that subway with advantage to themselves and convenience to the public, and that their refusal to do so would have the effect of destroying the admirable paving of the new street, the court would interfere, and restrain them from proceeding as they proposed.

The CHAIRMAN said the company he referred to had statutory powers, and the Court of Chancery would not interfere.

The motion was then put, and carried.

SHREWSBURY GASLIGHT COMPANY.

The Ninth Annual General Meeting of this Company was held at the Company's Offices, St. Mary's Street, on the 20th ult.—Mr. BLAKEMORE in the chair.

The notice convening the meeting having been read,

Mr. CATHELS, the secretary, read the report, which was as follows:—

The directors have again to present accounts which testify to the continued prosperity of the company's business. The balance-sheet and revenue account—copies of which have been sent to each proprietor—show a net profit (after adding £500 to the reserve-fund) of £2778. 6s. 3d., which amount, increased by the balance from last year, makes a total of £4161. 3s. 2d. available for dividends. The appropriation of this sum your directors recommend as follows—viz., the payment of the maximum average dividend of 7½ per cent. for the year on the several classes of shares, and a recoupment of 3 per cent. on the A, B, and first issue of new shares, for the deficiency of dividend for the year ended June 30th, 1860, in each case to be free of income-tax, and the balance to be carried forward to the credit of next year's accounts. These dividends will be payable at the company's bankers on and after the 5th of October next.

The main from the works to Abbey Foregate, alluded to in last year's report, was completed in the early part of the winter, and has resulted in affording an abundant supply of gas to that neighbourhood, without requiring to increase the pressure in the other parts of the town.

In the works, a duplicate boiler, engine, and exhauster have been provided, the fixing of all of which was nearly completed on the 30th of June, the date to which the accounts are made up; and other extensions and important improvements have been effected in order to place the works in an efficient state, and to secure the economical production of gas of good illuminating power and of the utmost purity.

Believing the affairs of the company to be in a sufficiently successful condition to warrant another reduction in the price of the gas, your directors have pleasure in intimating that they have resolved on making the following reduction to the private consumers, to take effect from Christmas next—viz., an unconditional reduction of 3d. per 1000 cubic feet, and a further discount of 3d. per 1000 on all accounts paid within ten weeks from the date of the account, thus substantially reducing the price to 4s. per 1000 to the smallest consumer. A reduction will also be made in the price of the gas supplied to the public lamps, commencing at the same date.

Two of your directors, John Hughes, Esq., and Wm. Harley Bailey, Esq., retire by rotation both being eligible for re-election. Mr. Onions, one of the auditors, who retires, is also eligible for re-election.

The CHAIRMAN said it was his duty to move that the report be received and adopted. The report showed the success of their undertaking. They had been at considerable outlay in improving and maintaining the works in an efficient state. Both labour and coals were dearer than they were last year, and, notwithstanding these drawbacks, they had done well. He never knew a year when they had so few complaints from the public as the present. They had improved the quality of the gas by improving the coal. Added to this they were now prepared to go for a further reduction in the price, and he believed that would be very satisfactory. Notwithstanding all their increased expenditure, their revenue had increased. Their works were in an efficient state, and they had given liberty to the manager to introduce any improvement he might think needed. He felt great pleasure, therefore, in moving the adoption of the report.

Dr. JOHNSON having seconded the resolution, it was carried unanimously.

Mr. W. H. BAYLEY said there was one fact which he thought it was important the public should be made acquainted with, namely, that although the company were only bound to make gas of 12-candle power, they were actually making it 16-candle power, so that, in fact, they exceeded by one-quarter what they were bound to do.

The CHAIRMAN said he had now to propose that an average dividend of 15s. per share, on the several classes of shares, be paid for the year ending June 30th, 1865, and that 6s. per share on the A, B, and first issue of new shares be paid in addition, as a reimbursement for the deficiency of dividend for the year ending June 30th, 1860.

Dr. JOHNSON said he had great pleasure in seconding the resolution.

The CHAIRMAN having put it to the meeting, it was carried *nem. dis.*

It was next proposed by Mr. CALLCOTT, and seconded by Mr. POOLE, that the retiring directors, Messrs. J. Hughes and W. H. Bayley, be re-elected.

An amendment was proposed by Mr. HAYCOCK, and seconded by Mr. WHITWELL, that Mr. Burr be appointed a director for the ensuing year.

It was also proposed by Mr. W. BURR, and seconded by Mr. ONIONS, that Mr. Keate be appointed a director.

The amendments having been put to the meeting, were carried by a large majority. The original resolution was therefore lost, and the old directors retire.

It was next proposed by Mr. G. E. LEAKE, seconded by Mr. KEATE, and carried unanimously, that Mr. Onions be re-elected as one of the auditors.

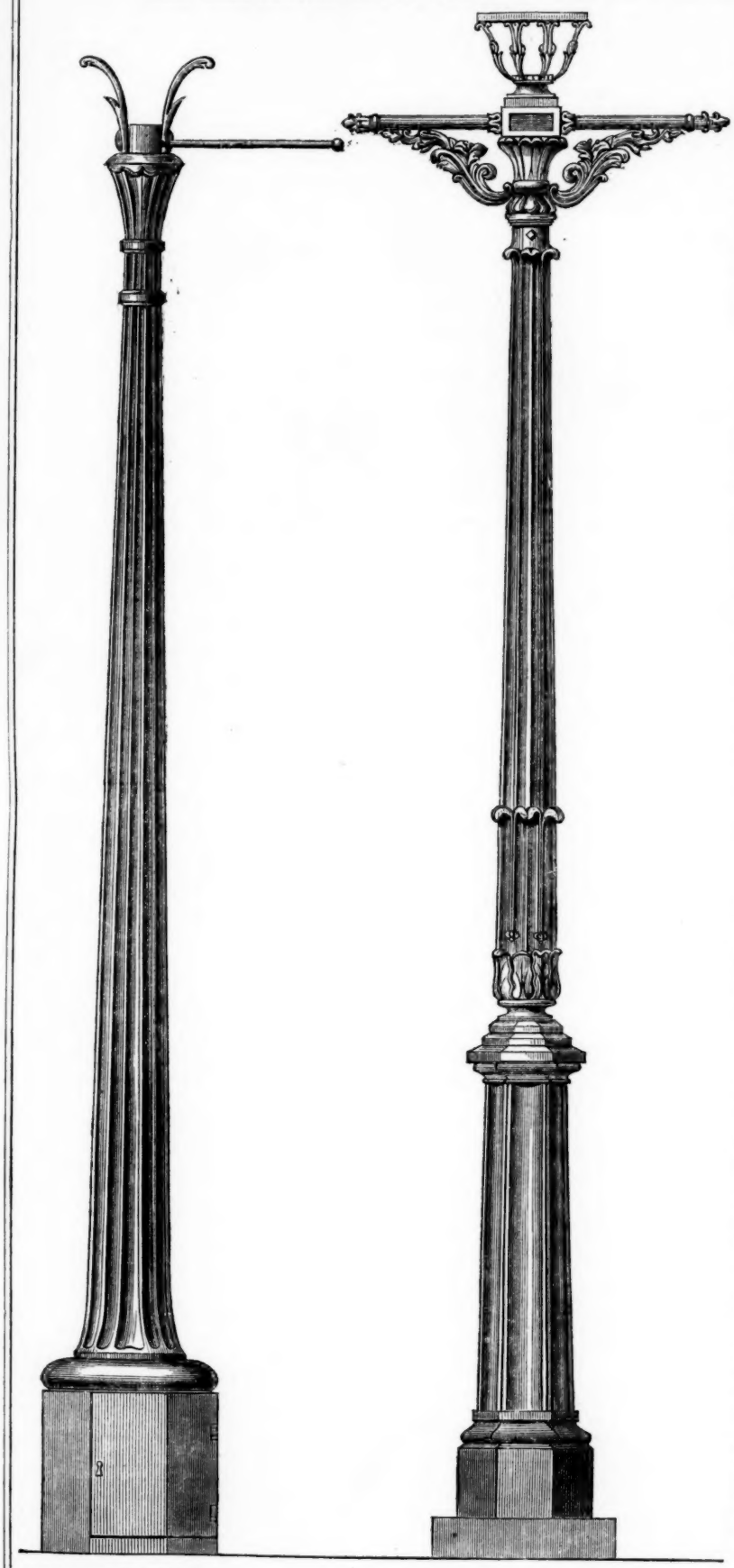
A recommendation that had been made to increase the salary of the collector, Mr. Baker, £20, was confirmed.

A SHAREHOLDER gave notice that at the next meeting he would propose that the several shares of the company should be converted and consolidated into stock, with a view to facilitating the general business of the accounts, and also giving a better opportunity of selling shares.

The CHAIRMAN said he considered the plan very feasible.

After some discussion, a vote of thanks to the directors and to the chairman was passed with acclamation, and the proceedings terminated.

THE LEAMINGTON LOCAL BOARD OF HEALTH AND THE GAS QUESTION.



Mr. HUGHES'S COLUMN. THE GAS COMPANY'S COLUMN.

From the Ideal Reporter of the Leam. Courier.

Our own reporter not being admitted to the discussion on the gas question, at the meeting of the local board on Tuesday, we have been obliged to trust to a less reliable medium of information, and append the following without, in the least degree, vouching for its authenticity.

After the reporters had withdrawn, Mr. GASCOYNE inquired if it was absolutely necessary to exclude the reporters.

The CLERK replied the board were going into committee, where the presence of reporters could not be permitted. They had done mischief enough for some time to come.

Mr. MUDDEMAN remarked what nice quiet meetings they had at Milverton and Lillington. Though reporters were occasionally convenient to have in attendance on a public orator like himself, they ought to be kept in their proper place, and not allowed to indulge any absurd ideas that they represented the public, or that the ratepayers had a right to know what was going on.

Mr. GASCOYNE considered that they had. When he introduced the question of Mr. Lund's salary, the Ratepayers Association——

Mr. MUDDEMAN and the board generally intimated that they were quite tired of hearing about Mr. Lund and the association.

Mr. GASCOYNE: At the end of three months——

The CLERK cut this observation short by reading the following report of the Gas Committee:—

"Your committee beg to report that they have seen Mr. Hughes on the subject of the gas. He told them that the company declined to have anything to say to him. The cost of this information, if the board had not wisely contracted for Mr. Hughes's services, would have been £5. 5s. and expenses. The clerk has read 376 letters on the subject, containing endless references to Acts of Parliament, but nothing tangible. Their receipt has been acknowledged by the gas company. The committee having decided to procure new gas-columns, Mr. Hughes has undertaken to prepare an elevation, section and isometrical perspective drawing of a new lamp-post of his invention, which is at the same time an illuminated clock, a pump, a pillar letter-box, a stand-pipe for water-carts, a drinking fountain, a ventilating shaft for the sewers, and a urinal. No regulating-tap is required to this, the gas being kept constantly burning. Though the consumption is thus rather more than heretofore, the new arrangement will save the expense of lamp-lighting, an important consideration. The glasses of the lanterns being coloured, the light is much more agreeable than that given at present, whilst they afford an excellent groundwork for advertisements of patent medicines, which your committee recommend should be solicited. As the present contract expires on the 29th inst., no time can be lost. The new drawings will be ready by the 3rd of October, when they will be submitted for the inspection of the board. Mr. Ladd, the electrician, has informed your committee that the electric or the oxyhydrogen light may, if necessary, be used for temporary street lighting at a slight increase on the present cost of gas. His plans seem simple, and easy of comprehension. The clerk has procured a bit of magnesium wire, which he consumed in the flame of a gas-jet before the committee, burning his fingers at the same time. He has suggested that if the town be left in darkness on the 29th of September, the present police force may be supplied with little pieces of the wire to burn in their bull's-eyes whenever they hear any one about the streets after the shops are shut. This plan your committee consider highly deserving of praise, being simple and economical, avoiding, as it does, the purchase of gas-columns. The clerk also stated that proper lamps for burning the wire may be had at a trifling cost. He has written to Mr. Alonzo Grant on the subject, as the board may light the town thus under the 6th and 7th Vict., c. LIX., sec. 85. The JOURNAL OF GAS LIGHTING has been submitted to your committee. The last number contains some meterillogical observations and remarks on your honourable board, which the clerk recommends should be proceeded against in pursuance of the Act of Parliament. Your committee don't know what to recommend, except to let the clerk and Mr. Hughes light the town between them. In the event of none of the modes indicated above being ready for adoption at the end of the month, the committee of the Pump Room Gardens have kindly consented to lend the board the 'grand Chinese illumination' lanterns used at Vance's *fête*. These suspended across the streets at night, with candles inside, will both illuminate and adorn the thoroughfares of this fashionable watering-place."

Mr. GASCOYNE characterized this as the most extraordinary report that ever came under his notice.

Mr. MUDDEMAN observed that the suggestions contained in it were practicable, and reflected credit on the committee. The clerk's suggestion was worthy of the highest praise.

The CLERK said that now the reporters were out of the way it would be well to state that there only remained ten days in which to complete fresh arrangements.

A MEMBER observed that he was quite aware of it. The time the board had frittered away in useless correspondence should have been employed in preparation.

[The clerk then entered the report on the rough minutes as approved and adopted, since it was not absolutely rejected, and directed his assistant to write for a hundred-weight of magnesium wire, two gross of Bryant and May's matches for the policemen, and also to inquire the price of paper illumination lanterns and night-lights.]

The CHAIRMAN observed that the letters had reference to preparation.

The CLERK said that he had better see Mr. Hughes with the committee on the subject. He would continue the correspondence, and the committee could report to the board at their next meeting.

THE PHŒNIX GASLIGHT AND COKE COMPANY.

The Adjourned Half-Yearly General Meeting of Proprietors was held at the Bridge House Hotel, Southwark, on Wednesday, Sept. 27—J. E. JOHNSON, Esq., in the chair.

Mr. PRIDDEN, the secretary, read the notice convening the meeting; the corporate seal was affixed to the register of proprietors, and the minutes of the last meeting were read and approved.

The following report, with the accounts annexed, was then presented:—

The directors submit herewith the trade account for the half year ending at Midsummer last, and the balance-sheet of the company at the same period.

During the half year, £36,294. 8s. 5d. of capital has been expended on plant. Of this, £28,027 was for land; £2000 on account of a new gasholder and tank, in course of erection by contract at Greenwich, and £6267. 8s. 5d. for additional mains laid in various parts of the company's district, being part of a much larger amount which will have to be expended to meet the still increasing demands for gas.

A new retort-house is also in course of erection by contract at Greenwich, and contracts will be shortly made for the erection of a new retort-house and of extensive apparatus for the purification of gas on part of the freehold land recently purchased at Vauxhall.

An agreement has been entered into for the purchase of additional premises at Vauxhall, and the directors rely on being able to report, at the next general meeting of proprietors, the completion of the purchase of the whole of the land the company is authorized to take under the provisions of its recent Act of Parliament.

To meet this further outlay upon plant, your directors recommend that a second call of 5 per cent. upon the new stock be made, amounting to £18,000, payable on the 1st of November next.

The expectations of the directors that they should be able to offer a successful opposition to the bill for the formation of a competing gas company in Kent, have been fully realized.

The "law expenses" chargeable to trade have been very heavy. They consist of £421, being the balance of £921 costs incurred in an appeal to Quarter Sessions against an assessment made on the company's mains in the parish of Lee, £1216 parliamentary expenses in opposing the Kent Gas Bill, and £214 similar expenses in opposing the Subway Bill. A large amount will also have to be paid for law expenses and compensations in consequence of an explosion of gas in Thames Street, Greenwich, caused by the construction of a new sewer in connexion with the main drainage.

During the half year a net profit of £38,518. 1s. 9d. has been realized, which with £8290. 12s. 6d. undivided profits, makes the sum of £46,808. 14s. 3d., out of which your directors recommend that dividends be declared at the following rates, viz.:—

On the £20 Divided Shares	10	per cent. per annum.
,, New Stock	7½	,, ,,
,, Capitalized Stock	5	,, ,,

less income-tax, leaving an undivided balance of £14,858. 14s. 3d.

Dr. *Abstract of the Trade Account, for Six Months, ending Midsummer, 1865.* *Cr.*

For Coals used	£37,416	2	7	By Rental for light	£85,661	19 11
Tradesmen's bills, for materials supplied	8,202	2	5	Coke made for sale	18,889	5 1
Law expenses	1,851	18	1	Breeze, ditto	493	13 5
Meters, and repairs thereof	1,306	17	11	Tar, ditto	2,994	7 5
Rent, rates, and taxes	2,218	12	1	Ammonia, ditto	1,600	15 6
Directors, £1000; auditors, £50	1,050	0	0	Interest received	345	7 8
Salaries	4,705	10	6	Miscellaneous receipts	193	11 7
Wages paid	13,094	18	8			
Bad debts and allowances	465	18	2			
Interest on bonds	1,348	18	5			
Net profit	38,518	1	9			
	£110,179	0	7		£110,179	0 7

Dr. *Abstract of the Balance-Sheet, at Midsummer, 1865.* *Cr.*

For Capital of 27,000 £20 shares, paid in full (maximum dividend 10 per cent.)		£540,000	0	0	By Amount of plant at Christmas last		£695,284 16 1
Capitalized stock, paid in full (maximum dividend 5 per cent.)		144,000	0	0	Add— Expended this half year in extension of works		36,294 8 5
New stock, £360,000, 10 per cent. paid up (maximum dividend 7½ per cent.)		36,000	0	0		£731,579	4 6
Bonds at 5 per cent.		72,500	0	0	Investment of leasehold-fund	7,859	18 11
Unpaid dividends		578	3	7	Amount due from sundries—		
Unpaid tradesmen's bills, &c.		10,893	10	3	Midsummer quarter	£28,305 19 7	
Leasehold-fund		7,859	18	11	Arrears	1,902 4 10	
Undivided balance	£ 8,290 12 6					30,208	4 5
Half year's profit	38,518 1 9				Amount due for coke	£3,566 13 9	
		46,808	14	3	Ditto breeze	97 8 0	
					Ditto tar	1,686 17 6	
					Ditto ammonia	600 12 1	
					Ditto sundries	1,248 2 8	
						7,199	14 0
					Stock of coals	£ 6,335 5 0	
					Ditto coke	15 0 0	
					Ditto breeze	27 0 0	
					Ditto tar	240 19 6	
					Ditto ammonia	135 16 0	
					Ditto meters	24,890 1 6	
						31,644	2 0
					Balance at treasurer's	£10,149 3 2	
					Ditto at interest	40,000 0 0	
						50,149	3 2
		£858,640	7	0		£858,640	7 0

JOSEPH BOX,
RICHARD DOWNS, } *Auditors.*

The CHAIRMAN: Gentlemen, it now becomes my duty to move—"That the report and accounts be received and entered on the minutes." In doing so, I have some few remarks to make respecting them. The first item in the accounts is that of coals, and I have to state that the increase in our consumption of coals, in consequence of the great increase in the amount of business done by us, is again manifest this half year, as in many previous half years. The quantity of coals carbonized this half year in advance of the quantity carbonized during the corresponding period of last year is no less than 3233 tons. Should we have a similar increase at our next half-yearly meeting, it will be nearly at the rate of 10,000 tons per annum, a consumption which is quite equivalent to the total supply for a very large provincial town. You must not, therefore, be surprised that we are asking for additional capital, nor that we are spending large sums of money in purchasing additional premises, and in the erection of additional works. To meet the large increase to which I have referred, it is absolutely and indispensably necessary, and your directors will take care that no more capital is expended than what the requirements of your business plainly require. They have at least this satisfaction, that with the increased consumption of coals there is brought back to them the means of paying dividends upon the increased capital for which the proprietors are asked. With reference to the other items in the accounts, I may remark that the tradesmen's bills for materials supplied are about the same, or a little more than last time, but not much. The "law expenses" are considerably heavier, and I am sorry to say that our prospects of a continued large expenditure under this head are by no means encouraging. We have had an appeal in the case of the parish of Lee against the amount at which we were assessed for the relief of the poor. We were formerly assessed there at a very small sum of money, and as our mains there increased, we were quite ready to assent to a reasonable increase in our assessment. This, however, was not agreed to by the parish authorities, and our assessment was increased to £1213. As I remarked, we appealed against this enormous increase, and the Court of Quarter Sessions reduced the assessment to £364, but the costs of that appeal were £921, of which £421 appears in this half year's accounts, and £500 in the previous half year's. I regret, moreover, to tell you that the question is still under litigation. The Court of Quarter Sessions granted a case for the superior court, and that has yet to be heard and adjudicated upon; so that whatever may be the result, there will be another considerable charge for legal expenses to be charged under this head. We have also, during this year, had to oppose the Kent Gas Bill in Parliament. That was a bill which was in direct violation of the Metropolis Gas Act, and we felt it our imperative duty to oppose its progress. Our opposition was successful, and the bill was rejected by Parliament before one-third of the evidence we had to produce was heard. Unfortunately, however, this opposition entailed upon the company a large expenditure, of which £1216 has been already paid, and £480 remains to be paid, and which will appear in our next half year's accounts. We had also to oppose, in connexion with the other Metropolitan Companies, the Subways Bill. All the companies united to oppose that bill, believing that it was a most dangerous measure. We were willing to assent to the proposal that our pipes should be placed in these subways, if it was to be done upon the responsibility of the public authorities who insisted upon it; but to adopt that course on our own responsibility, and, in addition, to pay an annual rent for the use of the subway, we thought was running a great risk, and one to which we ought not to be exposed. We succeeded in convincing a committee of the House of Commons that that was a correct view of the case, and though they did not throw out the bill, they agreed to release the gas companies from the obligation to make use of the subways. The consequence was that the promoters themselves withdrew the bill, but the cost to us was £214. There was also another matter before Parliament in which we felt it necessary to take part—that was the closing of Holland Street by the London, Chatham, and Dover Railway Company. We heard quite accidentally that that company were going to take a large portion of Holland Street into their possession, and to deal with our pipes as they thought proper. For the protection of our property, therefore, it was necessary for us to go to Parliament, and oppose them, for though the measure was not unreasonable in itself, we felt that we were entitled to complete protection with regard to the disposal of our pipes. The committee gave us some very strong, and I hope they will be found satisfactory, clauses for our protection, and upon these being placed in the bill, we were not at liberty to offer further opposition. But in thus interfering for our protection we incurred an expenditure of £626, an amount which is not yet paid. Another matter, too, under this head, arose out of circumstances which, probably, you have seen an account of in the newspapers—I mean the case of an explosion at Greenwich. A new sewer was being made there, and in filling in the earth one of our mains was fractured. That main had been doing good service for some years, and we had never known of any leakage upon it, nor in the house in which the explosion took place had an escape of gas ever been observed. I am not at liberty to say that the workmen engaged upon the sewer broke that main, the jury have decided that they did not, and I am not about to impugn their decision. We, however, have no doubt in our own minds that it was the effect of ramming in the earth that broke the pipe, the fracture being quite a recent one, and no escape of gas having been perceived until after the filling in and ramming down of the earth took place. The case went for trial, and the jury decided that the gas company were liable. It was a question with us whether we should go for a new trial, but knowing the generally unfavourable *animus* in the public mind with regard to gas companies, we thought it better to submit to the present loss and inconvenience rather than expose ourselves to further litigation and additional expense. That explosion will cost us no less than £2000. Well, then, gentlemen, the Union of Wandsworth is following much the same course as the parish of Lee did, and has increased our assessment to a most enormous amount. We have no alternative but to appeal. If we allow these things to pass over, the whole of your profits will be absorbed in parochial rates. The consequence, however, is, that I am afraid,

for some time to come our expenses under the head "law" will be considerably increased—there is no help for it. The other items in the account are much as usual. "Meters and repairs thereof" are about the same. "Rent, rates, and taxes" have a little increased, in consequence of the increase in our assessments. "Salaries" are a little less. "Wages" are not increased, but I am sorry to tell you that there is a general feeling throughout all gas companies on this question of wages. The workmen are very discontented, and I fear that in gas-works, as in every other department of labour in the kingdom, there will be, before long, a considerable rise in the wages of the men. If so, the amount charged under this item will be much greater. "Bad debts and allowances" are very small. The "Interest on bonds" is much the same; of course that varies with the amount we raise from time to time. Then comes the question of the "Net profit," which is a little larger than at this period last year. But bear in mind that that is accounted for by the fact that we have recently reduced the price of gas. Notwithstanding that reduction, the increased consumption upon the larger quantity of coals carbonized gives us a little more profit than last year. On the other side of the account the receipts per ton in the form of rental are a little less, which is attributable to the fact that the unaccounted-for gas has been greater to some extent, though it is not very large. In consequence of the complaints of the want of gas last winter, we were compelled to put on an increased pressure. The result was that at every street lamp there was a larger consumption, and at every place where there was a leakage in the mains the escape of gas was greater. The difference, however, is not important, and it is in some degree made up by the coke account. During the half year, the coke has realized 9s. 5d. per chaldron against 9s. 0¾d. last year, the quantity made being pretty nearly equal. The returns for the other residual products present an appearance very much the same as they have done before. Taking all these items together, they leave a net profit of £38,518, and after paying out of that the dividend which we recommend you this day to declare, there will remain a very considerable sum of undivided profits, amounting to no less than £14,858. The question may perhaps be asked, why, out of so large a surplus, we do not give the proprietors something on account of back dividends. Our answer may be gathered, in some measure, from the remarks I have already made. We are increasing our capital largely, and at the end of the year shall have to pay dividends upon a much greater amount than before. Our law expenses are very much increased, and we have to pay a considerably larger amount in wages. Indeed we are really in that state of uncertainty as to what our position will be at the close of the year, that we have thought it best to pay you only the bare amount of dividend at the full rate for the first half, leaving the balance until the next half, in order to see what the result may be. If we should then be in a position which will fairly justify the payment of back dividends, the directors will be only too happy to ask your approval of the same. It is the course which they adopted last year. You will recollect that at Midsummer last year we paid no back dividend, but at the close of the year we did do so, and we hope, notwithstanding the present appearance of things is not very favourable, that at the close of this year we shall be able to do the same. That, however, must depend upon the result. The directors ask you to bear with them in their recommendation on this occasion to pay the bare dividend, leaving the other matter till the close of the year. And now, gentlemen, with regard to the question of capital. It is a very serious question. The amount we have received and expended during the last two years is very large indeed. The capital raised since Christmas, 1863, has been, new stock, £36,000; money raised by bonds, as shown in the accounts, £72,500; other moneys raised by bonds since Midsummer, and not shown in the accounts, £39,000, making the total sum raised £147,500. We have still bonds which we may issue to the amount of £13,500, but we have not felt it right to raise the whole amount that we can raise in that way, and for this reason. Our bonds are of that character, that upon certain notice given they are to be repaid; and presuming that we received notice to repay a large sum of money for which we have bonds now out, and we had raised all the money we could raise in that way, we should be obliged to go into the market and obtain money in excess of our borrowing powers. We have heard what has been said upon that subject in another place, and we feel that that would be a position in which we should not like to stand, and that it is desirable, if possible, to keep a margin of unraised money upon bonds, so that in case of any claim being made upon us to a heavy amount on this score, we should have the means of meeting the demand upon us. We have, therefore, a reserve of £14,858, and we intend to propose a call to-day of 5 per cent. upon the new stock, payable on the 1st of November, which will amount to £18,000 This is a large sum of money, but we have already expended £24,000. At Christmas, 1864, we had expended £35,941; at Midsummer, 1865, we had expended £39,294; and we have made purchases and entered into contracts since Midsummer, to the following effect: works at Greenwich, where we are building a large retort-house, a new gasholder and tank, with the necessary connexions and pipes, £32,478; a large retort-house at Vauxhall, a purifying-house, and all necessary apparatus, costing £35,753; there is also a new coal-store at Bankside, £3852; additional mains throughout the district for the distribution of our large make of gas, £12,600. Then there is an expenditure in the purchase of land at Vauxhall, £16,000; and all these items together (deducting the sum of £8266 already paid) amount to £92,417, and the total of all those sums I have mentioned put together comes to £188,881, or £9881 more than we have raised, even when the £18,000 call is all paid in. We have, however, always at the beginning of the year a large amount of money in hand, as we are collecting in the spring the rental of two winter quarters, and we can for a period avail ourselves of that, which will carry us over for some months—probably till the following September—so that it will not be necessary to raise a larger sum of money than we now ask for, reserving to ourselves the power to come before you at some future time for futher funds. This is not a very agreeable picture of the demands likely to be made upon the proprietors, but I may give it as my clear and strong conviction, that the proprietors may rely, with considerable confidence, upon the statement that, notwithstanding this large expenditure of money, they will be able from time to time to receive the full dividend which the law allows them. With these remarks, and holding myself ready to answer any questions which may be asked, I will now move—"That the report and accounts be received and entered upon the minutes."

Mr. Bentley said he had much pleasure in seconding the resolution. He thought the course pursued by the directors was a very wise one, and well calculated to promote the interests of the shareholders at large.

Mr. Innes (the company's engineer), in reply to Mr. Box, said the diameter of the new gasholder at Greenwich was 120 feet, and its cubical capacity 80,000 feet. The new retort-house would accommodate 22 beds, containing in all 326 retorts.

Mr. Box said he thought the directors had exercised very great discretion in the management of the company's affairs; and he had no doubt that, notwithstanding the difficulties to which the chairman had referred, the company would soon recover its position.

Mr. Hodgson said he quite agreed in the remark made by the chairman, that with the law expenses going on, it was necessary to keep a larger balance in hand than was done last year. He was himself a director of the Sheffield Gas Company, and therefore could fully sympathize with the Phœnix Company in reference to the question of parochial rates. The question was a very serious one, and he might inform the meeting that at Sheffield the directors had had it in hand some eight or ten years. Considering the large number of parishes through which the Phœnix Company's pipes extended, the shareholders must not be surprised if they had their lawyers at work for half a dozen years to come. At present the amount paid under the head of "Rent, rates, and taxes," was comparatively small; and if they could succeed in keeping it down to anything like that amount they might be very well contented. The rates which the Sheffield Company paid far exceeded, in proportion to their rental, the amount which this company had to pay, so that as yet the shareholders of the Phœnix might congratulate themselves upon the subject. The item of "Bad debts" in the accounts was not a large one, but still he thought there was room for a little improvement. In proportion to the business done, it was more than double the amount at which this item stood with the Sheffield Company. The principal object which he (Mr. Hodgson) had in coming to the meeting was to elicit some information with reference to the creation of the new stock. At the last half yearly meeting of the company—according to the report of the proceedings in the Journal of Gas Lighting—Sir C. D. Crossley suggested that it ought to be a 7½ per cent. preferential stock; but if the worthy knight had reflected for a moment, he must have seen that to raise the money necessary to carry on large new works thus would be prejudicial to the old shareholders. Moreover, it would indicate that the company were in very bad odour if they could only raise money by the creation of a 7½ preference stock. Sir C. D. Crossley on that occasion also asked a question which from the report did not appear to have been answered—viz., whether in the event of the present 10 per cent. dividend upon the original shares being, from the lowering of the price of gas, or from any other circumstance, reduced, the 5 per cent. and the 7½ per cent. stock would participate in the altered state of things. Sir Charles, in asking the question, evidently felt that there was some doubt as to the result of the reduction in the price of gas. But he was wrong in both his assumptions, if he (Mr. Hodgson) read the Act of Parliament aright. The stock was not 7½ per cent. preference, nor was it 7½ per cent. stock that would be subject to a reduction when the dividend on the original shares became reduced from any cause. He had reason to know the working of these matters, from his experience at Sheffield. There the company issued a similar stock to this 7½ per cent., only that it was 8 per cent. as against 10 per cent. of the old shares. The question arose in this way:—There was one half year in which the company could not pay the original shareholders 10 per cent.; the dividend was reduced to 9 per cent., and the directors held that the 8 per cent. stock should participate in a proportionate reduction. He was one of the largest new shareholders, and held a different opinion. He considered that there was one common risk up to 8 per cent., and that if there were more profit made than 8 per cent., then the old shareholders were entitled to it up to 10 per cent. There being a difference of opinion, the directors acted in a most gentlemanly way, and consented to have a case stated for the opinion of the Court of Chancery upon it, he (Mr. Hodgson) and two other large shareholders being made parties to the suit. They went into the matter in the most friendly spirit, the directors being prepared to abide by the decision of the court. The Vice-Chancellor Wood, before whom the case wes heard, decided at once that the new shares took a common risk with the ordinary shares up to 8 per cent.; and that if the profits were more the ordinary shares participated up to 10 per cent. The directors were perfectly satisfied with this decision, and had gone on for nine years upon the principle thus laid down. The 7½ per cent. stock of the Phœnix Company was not preferential but general stock, and so also was the 5 per cent. If he read the Act of Parliament aright, it did not necessarily follow that in all cases these stocks would receive 7½ and 5 per cent., because the company might get into low water; at the same time, he was not at all apprehensive on the subject. He was perfectly satisfied with the risk, and only made these remarks in consequence of what was said at the last meeting, so as to guard the holders of new stock from supposing that they were preference holders.

The Chairman said the question upon which the worthy proprietor had touched was an altogether separate one to the question before the meeting, but he was sure the proprietors were pleased to listen to a gentleman who had had experience in these matters.

The motion was then put, and carried unanimously.

Mr. Horner (deputy-chairman) moved the next resolution. He said the chairman had so completely explained the whole business of the company, that it was not necessary for him to detain the meeting with any lengthened remarks. He would only congratulate the proprietors upon the fact that the profits enabled them to pay the full dividend for the whole half year upon the capital called up, notwithstanding the reduction in the price of gas to the public He moved—"That dividends for the half year ending Midsummer last be and the same are hereby declared out of the profits of the undertaking at and after the rate of 10 per cent. per annum on the original shares of the company, at the rate of 5 per cent. upon the capitalized stock of the company, and at the rate of £7. 10s. per cent. upon the paid-up part of the new stock of the company, deducting income-tax; that the said dividends be payable immediately after the business of the meeting has terminated; and afterwards at the company's office, at Bankside, on Thursday, the 28th inst., from the hour of twelve till three, and also on Wednesday, the 4th of October, from the hour of two till four, and afterwards forwarded by post."

Mr. Rhodes seconded the motion.

Mr. Gray said nothing could be more satisfactory than the statements which had been laid before the meeting by the chairman. He felt sure that the directors had exercised a sound discretion in not recommending a higher dividend for the half year than 5 per cent. It was absolutely necessary that they should have some money in reserve, for no one could tell how the present state of things might result. With respect to the remarks of the previous speaker, he (Mr. Gray) must have strangely misunderstood what fell from Sir C. D. Crossley at the last meeting, if the worthy knight then contended that the 7½ per cent. stock should bear a preference dividend. He believed Sir Charles' suggestion was confined to the 5 per cent. stock, but he also stated that it would be satisfactory to know whether the dividends would fluctuate with the condition of the company. The chairman, in the exercise of his discretion, did not give an answer to that question, and he (Mr. Gray) thought that he acted wisely in not doing so. It was impossible to foresee what the condition of the company would be, but his own impression was that all the dividends would be in proportion the one

to the other. The chairman had referred to the movement which was being made, particularly amongst those engaged in the manufacture of gas, to obtain an advance of wages, and no doubt at no distant day a considerable addition would be made to the expenditure of the companies under the head of "Wages," which addition would make a corresponding reduction in their profits, unless there was a large increase of the rental. He believed that under the efficient management of their excellent friends at the board, who had so judiciously extended the works as to enable them to meet whatever demand was made upon them, such would be the case. With reference to the great increase which was being made in the rates, he thought there could be no doubt that there was a settled determination on the part of the parochial authorities everywhere to relieve individual ratepayers as much as they could by throwing unreasonable burdens upon gas, water, and railway companies. He sincerely hoped that they would be frustrated in that unjust and unfair attempt, and that a more equitable system of assessment than now prevailed would be introduced. With reference to the legal proceedings to which the chairman had alluded, he thought the directors acted wisely in not moving for a new trial, and so prolong litigation, which might only have led to additional expense. The gas companies at the present time went into court under great disadvantages. Whenever an accident took place every means were made use of to exaggerate the loss, and in this way the companies were laid under very heavy contribution. He hoped, therefore, the directors would avoid law as much as possible consistently with the interests of the company, for these legal proceedings were profitable to no one but the lawyers.

The motion was then put, and carried unanimously.

The CHAIRMAN moved a resolution declaring a call to be made upon the new stock of the undertaking of 5 per cent., payable to the treasurer of the company, R. C. L. Bevan, Esq., of Lombard Street, on or before the 1st of November next. He had already stated that the directors found it impossible to go on without making the call, and it was needless to obtain loans from the bankers for their purposes when the company had a fair prospect of paying the full dividends upon the amount now to be called up. With regard to some observations which had been made, he would only remark that the directors had come to no resolution, nor had they the power to do so, to make these preference stocks. They could certainly offer a recommendation to the proprietors to that effect, but it had hitherto been thought better to leave these stocks just as they stood. The time for the discussion whether either of them should have a preference dividend or not would be when the profits of the company would not enable them to pay the full dividends to all classes of shareholders. At present they could pay all, and he hoped they would be able to do so for a very long time to come.

Mr. GRAY seconded the resolution.

Mr. C. DOWNES inquired whether the directors could give the meeting an idea when a further call was likely to be made.

The CHAIRMAN said he was afraid another year would not pass over without one.

The motion was put, and carried *nem. dis.*

On the motion of Mr. BENTLEY, seconded by Mr. PERRY, a cordial vote of thanks was presented to the chairman and directors for the able manner in which they had conducted the affairs of the company.

The CHAIRMAN briefly acknowledged the vote, and the proceedings terminated.

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the Albion, Aldersgate Street, on Thursday, the 28th ult.—ERASMUS WILSON, Esq., F.R.S., in the chair.

Mr. OHREN, the secretary, having read the advertisement convening the present and the minutes of the last meeting, the seal of the company was affixed to the register of shareholders.

The following report and statement of accounts were then presented:—

The directors have the satisfaction of reporting the success of the company's operations during the half year.

The works and plant are in good order, and effective; the new gasholder, having a capacity of upwards of 400,000 cubic feet, is complete, and ready for use.

In anticipation of increasing demands on the manufacturing power, the directors have entered into contracts for the construction of a new retort-house, capable of containing, when completed, 126 double retorts; together with additional purifiers, condensers, engines, meter, &c. The building and apparatus are now in progress, and are expected to be in readiness for use in time to meet the pressure of the winter season.

The directors have given notice of a further reduction in the price of gas, and are giving their attention to improvements in its manufacture. They are also endeavouring to secure to the consumers an illuminating power of not less than 14 candles—namely, 2 candles above the standard fixed by the special Act of the company.

The new shares created by the recent Act of Parliament have all been taken up by the shareholders, the demand being greatly in excess of the number to be distributed.

The directors have appointed Dr. Letheby, the eminent analytical chemist, to the vacant office of chemical adviser to the company.

Mr. R. M. Christie having resigned the office of consulting engineer, the directors have considered it advisable that their engineer should be resident on the works. They have, therefore, in fulfilment of that object, appointed Mr. Frederick Leslie engineer to the company, Mr. Leslie having been recommended to them with high testimonials.

The balance-sheet for the half year to the 30th of June last, and appended to this report, shows the financial position of the company. The profits for the half year are £4413. 0s. 11d., which, together with £271. 4s. 4d., the unappropriated profit of the preceding half year, makes the available balance £4684. 5s. 3d. Out of this sum the directors recommend the declaration of a dividend at the rate of 6 per cent. per annum on the preference capital, a dividend at the rate of 10 per cent. per annum on the ordinary capital of the company, and the sum of 2s. per share in payment on account of arrears of dividends on the ordinary shares in previous years, all free of income-tax; the balance of £184. 5s. 3d. to be carried forward to the profit of the succeeding half year.

Dr. *Profit and Loss, Half Year ending June 30, 1865.* *Cr.*

To Amount for coals carbonized		£6,320	13	2		
Lime and oxide		203	15	2		
Trade charges		764	7	3		
Rent, rates, and taxes		401	19	10		
Directors and auditors fees		530	0	0		
Salaries and collector's commission		725	9	9		
Wages		1,995	19	11		
Interest on loans		665	13	8		
Bad debts and allowances on collection		121	0	2		
Law charges		14	14	1		
Contingent-fund		600	0	0		
Retort account		344	0	0		
Parliamentary expenses		200	0	0		
		£12,887	13	0		
Balance		4,413	0	11		
		£17,300	13	11		
By Gas-rental	£13,449	18	6			
Meter-rental	200	17	8			
				£13,650	16	2
Coke made for sale				2,714	2	1
Breeze ditto				163	8	8
Tar ditto				255	17	11
Sundries				21	1	4
Sulphate of ammonia—net profit				367	6	8
Interest on deposit at bankers				128	1	1
				£17,300	13	11

Dr. *Balance-Sheet, June 30, 1865.* *Cr.*

To Proprietors for paid-up capital—				By Amount for plant, &c.		
5000 shares, at £10 per share	£50,000	0	0		£104,837	5	5
5000 preference shares, at £10 per share	50,000	0	0	Freehold land	8,793	1	10
Loans	25,600	0	0	Preliminary expenses	3,384	13	1
Amount due to sundry persons	9,007	9	7	Parliamentary ditto	493	15	4
Contingent-fund	349	15	7	Retort account	641	6	0
Interest on investment of contingent-fund, to June 30, 1865	£ 77 15 0			Stock on hand	6,171	14	6
Appropriated from profit and loss for contingent-fund	600 0 0			Amount due from sundry persons	1,220	13	8
	677	15	0	Invested in Consols from contingent-fund	164	5	5
Profit unappropriated, Dec. 31, 1865	271	4	4	Private rental and arrears	4,781	5	6
Profit and loss	4,413	0	11	Public rental and fitting arrears	1,244	5	2
				Balance at bankers	1,976	19	6
				Deposit at ditto	6,000	0	0
	£139,719	5	5		£139,719	5	5

Appropriation of Balance.

Balance brought forward from last account	£ 271	4	4	Dividend on preference share capital, at 6 per cent.	£1,500	0	0
Ditto of profit and loss, June 30, 1865	4,413	0	11	Ditto on ordinary share capital, at 10 per cent.	2,500	0	0
				Payment on account of arrears of dividend on ordinary share capital, at 2s. per share	500	0	0
					£4,500	0	0
				Balance to be carried to next account	184	5	3
	£4,684	5	3		£4,684	5	3

The CHAIRMAN, in moving the adoption of the report, said it must, he thought, be very gratifying to the shareholders to witness the very prosperous position which the company at present occupied. There was evidence of progress in the report, and he thought they might congratulate themselves thereupon. The business of the past half year had been very satisfactory in every way. The works were increasing in dimensions, and increasing also, he hoped, in perfection. As would be seen by the report, the directors had completed a magnificent gasholder, which was now doing its work with that charming ease and grace which one would expect from a gasholder so honourably christened as that one was. The first stone of this important work was laid on the birthday of the Princess Beatrice, and in honour of the day the gasholder was christened after Her Royal Highness. The vessel had shown herself a right royal one, and he trusted that it would turn out as advantageous to the Crystal Palace District Gas Company as the reign of the present Royal Family had done to the country at large. There was another point in the directors report which the shareholders always paid great attention to, and looked upon as perhaps one of the most important of the whole, and that was the promise of a reduction in the price of gas to the consumers. That, he might say, was one of their great aims, and he was not quite sure whether the shareholders did not prefer being able to reduce the price of gas to the public to securing an increased dividend for themselves. Such was their philanthropic feeling: at any rate, they rejoiced that they were able to make a considerable reduction in price, and in that direction was expressed the fact that they had consolidated their own position in the district. So long as they pleased their consumers by producing good gas, and distributing it at a reasonable price, they might consider their position and success very satisfactorily established. It would be seen from the report also that they were ambitious to exceed the parliamentary standard as to the illuminating power of their gas, and that they were endeavouring to secure to the consumers an illuminating power of not less than 14 candles, a quality which could not fail to be in the highest degree satisfactory. The shareholders would also see that they had made arrangements for the supervision of their manufacture in this respect by one of the most able chemists in this country—a man whose name was well known in the City of London, and whose talents were fully recognized in the scientific world. He referred to Dr. Letheby. The only other point which appeared upon the report was the resignation of Mr. Christie. Having been so long connected with that gentleman, it was naturally a source of very great regret that their union with him should be dissolved; but, under the circumstances, it was very possible that it might turn out for the advantage of the company, because it enabled the directors to appoint a resident engineer. In the selection of that officer

they had been fortunate enough to secure the services of Mr. Leslie, a gentleman thoroughly well known in the gas world, and whose exertions would no doubt result in the maintenance of the works of the company in the best possible condition. Mr. Leslie certainly brought zeal to the work, and when he came to know, as he (the chairman) already knew, the very considerate and very agreeable body of shareholders for whom he had to labour, he would have an additional motive for using all his exertions to secure the success of the undertaking. He would conclude by moving—"That the report and accounts now presented be approved, adopted, and entered upon the minutes."

Mr. WILLIAMS seconded the motion.

The CHAIRMAN, in reply to an inquiry, said the expense to which the company had been put for the damage done to the gasholder by the snow was £800.

Mr. HADLAND inquired what reduction had been made in the price of gas.

The CHAIRMAN said it had already been reduced to 4s. 8d., and would shortly be reduced to 4s. 7d. per 1000 cubic feet.

Mr. H. P. STEPHENSON, in reply to several inquiries, said the amount of money on loan at the time the accounts were made up was £25,000, and the interest paid upon it was about 5 or 5¼ per cent. It was true that at that time they had a deposit at the banker's of £6000, upon which they received a smaller rate of interest, but that was only a temporary matter. It would be seen on the other side of the account that there was a balance of about £9000 due to sundry persons, which had to be paid, and since the accounts were made up that deposit had been withdrawn, and in addition £10,000 had been called up from the shareholders upon the new shares. There had not been anything paid off the preliminary expenses. During the past half year £200 was written off the parliamentary expenses, and the directors thought it better to write that item down to *nil* before they touched the other, but as soon as the opportunity served they would be glad to reduce it.

The motion was then put, and carried unanimously.

Mr. C. LEA WILSON moved, and Mr. JAMES CURTIS seconded, the following resolution, which was agreed to:—"That a dividend at the rate of 6 per cent. per annum on the preference capital, a dividend at the rate of 10 per cent. per annum on the ordinary capital of the company, and the sum of 2s. per share on account of arrears of dividend on the ordinary shares in previous years, all free of income-tax, be now declared for the half year, and made payable forthwith."

Mr. H. P. STEPHENSON said the report had explained the arrangements which the directors had made consequent upon the resignation of Mr. Christie as consulting engineer. Previously Mr. Ohren occupied the position of secretary and manager, but now he was relieved of the duties of the latter office, and was able to devote the whole of his time to the secretarial department. Hitherto his salary as secretary had been fixed by the shareholders, and his salary as manager by the directors. It would now belong to the shareholders to settle the amount of his entire remuneration, and he moved—"That the salary of the secretary of the company be confirmed at the present rate of £400 per annum." In addition to his salary, Mr. Ohren had a residence, with coal and gas.

Mr. G. HYDE seconded the motion.

Mr. BOX thought the salary was not sufficient, and moved that the amount be £500 a year.

Mr. URLING seconded the amendment, remarking that Mr. Ohren's indefatigable attention to business, and the courtesy which he always displayed to the shareholders, fully entitled him to their esteem and liberality.

Mr. STEPHENSON, in reply to an inquiry, said the engineer's salary was £400 a year, with residence, gas, &c. Mr. Christie, as consulting engineer had £100 a year, and 5 per cent. commission upon the work carried out.

The amendment, upon a show of hands, was carried unanimously.

Mr. GLAISHER moved—"That the best thanks of the meeting be given to the directors for their able management of the affairs of the company for the past half year." Having recently inspected the works, he could speak to the high state of efficiency in which they were maintained, while the accounts presented on this occasion testified to the ability with which the business arrangements of the company were transacted. He congratulated the proprietors on the prosperous state of the company's affairs, and asked them to acknowledge the obligations they owed to the board, whose exertions had contributed so much to that result.

Mr. BOX seconded the motion, which was very cordially adopted.

The CHAIRMAN acknowledged the vote.

The Rev. G. POCOCK moved a vote of thanks to the auditors and officers of the company for the efficient discharge of their duties.

Mr. HADLAND seconded the motion, remarking that the prosperity of the company depended so much upon the exertions of the officers, and the correctness of their accounts, upon the ability and integrity of the auditors, that it was always a pleasure on occasions like the present to acknowledge services of this kind well performed.

The motion was unanimously agreed to.

Mr. PURVIS acknowledged the vote on behalf of his brother auditor and for himself.

Mr. OHREN, on behalf of the officers of the company, returned thanks for the vote, and expressed for himself the further obligation under which he was laid by the liberal increase made in his salary. These indications of the approval and confidence of the shareholders would, he said, stimulate him to, if possible, greater exertions to promote the interests of the company, and to secure the continuance of its present prosperity.

Mr. LESLIE having also acknowledged the vote, thanks were given to the chairman, and the proceedings terminated.

COUNTY AND GENERAL GAS CONSUMERS COMPANY, LIMITED.

The Half-Yearly Meeting of the Proprietors was held at the Offices, St. Benet's Place, Gracechurch Street, in the City of London, on Thursday, the 28th ult.—R. M. CHRISTIE, Esq., in the chair.

Mr. R. S. PARKER, the secretary, read the notice convening the meeting, and the following report of the directors:—

The directors beg to submit to the members the balance-sheet and accounts for the half year ended the 30th of June, 1865. The number of shares issued up to that date amounts to 7827, on which there has been received £38,910, being an increase on the paid-up capital of £684. The expenditure on capital account during the half year for extensions and improvements, &c., amounts to £1468. 3s. 4d.; after making provision for bad debts and allowances, and the payment of £639. 14s. 3d. for interest on loans, the revenue account for the half year shows a gross profit of £798. 3s. 11d., which, with the unappropriated balance of £157. 1s. 11d. from the last account, shows a profit of £955. 5s. 10d. From this amount the directors have considered it the most advisable course to write off £250 from parliamentary expenses, £20 from law charges, and £500 from Chertsey loss account; leaving an unappropriated balance of £185. 5s. 10d. to be carried forward to the credit of the current half year. Under these circumstances, they are sorry that on the present occasion they cannot recommend the declaration of a dividend; and they trust the members will approve the course they have deemed it prudent to take, feeling assured it is better for the interest of the company that the various items of expenditure to be liquidated out of revenue should be reduced as speedily as possible. The directors, however, are glad to find, in comparing the present with the two previous half year's working, that the business is satisfactory, and shows an increasing improvement.

Dr. *Balance-Sheet, June* 30, 1865. *Cr.*

CAPITAL AND LIABILITIES.				PROPERTY AND ASSETS.			
Capital—				Property held by the company—			
Received from sundry shareholders, viz.:—				Leasehold buildings and plant at Northfleet, Pater, Pembroke, and Lea Bridge.	£25,912 10 6		
£5 per share on 5677 ordinary shares 4. 10s. „ 50 „ „ 3 „ 100 „ „	£28,910 0 0			Freehold buildings and plant at Walton, Ware, and Ely	28,929 0 10		
5 „ 2000 preference shares.	10,000 0 0					£54,841 11 4	
		£38,910 0 0		Stock in trade at sundry works	£3,510 17 6		
Debts and liabilities—				Office furniture and fittings	92 18 4		
Debentures and loans	£15,401 3 4					3,603 15 10	
Mortgage on sundry works	4,000 0 0			Items of expenditure to be liquidated out of revenue by instalments—			
Balance of purchase-money of Ware works, as per contract, to be paid off by annual instalments	£1,000 0 0			Preliminary expenses	£1,100 0 0		
Ditto of Ely works, ditto	3,016 13 4			Parliamentary ditto (law costs)	650 0 0		
Tradesmen and sundries	2,006 2 1			Law charges	230 0 0		
Acceptances for goods supplied	2,037 5 11			Chertsey (loss account) being loss on sale of works	1,800 0 0		
	27,461 4 8					3,780 0 0	
Profit and loss		185 5 10		Debts due to the company—			
				Gas and meter rental under collection, and sundries	£3,378 2 5		
				Chertsey Gas Consumers Company—balance due to company for works sold.	600 0 0		
						3,978 2	
				Cash—			
				Balance at bankers	£ 351 1 10		
				Petty cash in hand	1 19 1		
						353 0 11	
		£66,556 10 6				£66,556 10	

Dr. *Profit and Loss Account.* *Cr.*

To Coals carbonized	£1,894 13 4			By Balance from December, 1864		£ 157 1 11
Lime and purifying materials	92 15 11			Gas and meter rental	£4,598 8 8	
Wages and labour	781 17 9			Products and sundries	774 14 8	
Rent of sundry works	74 10 0				5,373 3	
Local rates and taxes	157 13 4					
Commission and agency fees	168 6 1					
Travelling expenses	31 10 3					
Miscellaneous and petty charges at works	120 14 6					
Allowances and discounts	35 10 3					
Bad debts	38 13 2					
Retorts	92 0 0					
		£3,438 4 7				
Office expenses, including directors and auditors fees, rent of offices, salaries, stationery, printing, and petty expenses	£ 497 0 7					
Interest account	639 14 3					
Parliamentary expenses account, written off	250 0 0					
Law charges account, ditto	20 0 0					
Chertsey loss account, ditto	500 0 0					
		1,906 14 10				
Balance—profit		185 5 10				
		£5,530 5 3				£5,530

The CHAIRMAN expressed the regret he felt in being obliged to occupy the position he then held, owing to the indisposition of Mr. Craufurd. There was but little in the report and accounts which called for any observation from him. It would be seen that the company had made some improvement during the half year, although on the present occasion the directors were unable to recommend the payment of a dividend. The accounts as compared with the last two half years, showed a fair increase of profits. The actual increase was this: at June, 1864, the profit was £417; at Christmas, 1864, it was £614; and at June, 1865, it was £798; or about £200 each half year. This was in itself very satisfactory, and the directors had every reason to believe that the improvement would continue. They could, if they deemed it wise, have recommended the payment of a dividend for the past half year, but they felt that that was not a course which they ought to pursue, seeing how badly off the company were for capital. In fact, before now they ought to have appealed to the shareholders for additional funds, and they would be very glad if the gentlemen present would give them their opinion as to the best mode of increasing the capital of the company. The directors required about £5000 to put the company in a fair working position, and if that amount were raised there was no reason why the whole of the profits actually made should not be divided amongst the shareholders. He might mention that while making the extra profits to which he had referred, they had been reducing the price of gas at several of the stations, and an examination of the accounts would show that in several items improvements had taken place. The board were desirous to make every possible reduction they could in the working expenses, and, as he had already remarked, if they had only capital sufficient to meet the requirements of their business, they would be able to pay the proprietors a satisfactory dividend. With these remarks, he moved the adoption of the report.

Mr. WILLIAMS seconded the motion.

Mr. WHIFFEN said there was one item in the accounts which seemed a stereotyped item—viz., "Chertsey Gas Consumers Company—balance due to company for works sold." He wished to know whether there were any means of recovering that amount.

The CHAIRMAN said the money had been received since the accounts were made up. It was their own fault that they did not get it sooner.

Mr. WHIFFEN thought that in the present position of the company's affairs it was necessary that they should endeavour to retrench their expenditure. He suggested that the number of directors should be reduced, and that the remuneration to the board should be cut down. He thought also there should be more economy in reference to the staff of the company. He disapproved altogether of the policy of the directors.

Mr. FOXALL said he thought the only mistake they had made was in reference to the Chertsey business, but for that the proprietors had themselves very much to blame, because many of them never came to the meetings to advise what was best to be done, and the directors were left to act as their own judgment dictated.

Mr. CRANEY expressed himself of the same opinion as Mr. Whiffen, and thought four directors were quite sufficient to manage the affairs of the company.

Mr. PURVIS said it was hardly worth while to discuss that question now, because they could take no practical action upon it. The proper time would be at the next meeting, when the election of directors would take place.

Mr. R. J. CLARKE said the directors had a very difficult task to perform in the management of the company's affairs, and were obliged to make themselves personally responsible for the moneys which they raised on loan from the bankers.

After some general conversation on the subject of the necessity of a reduction of expenditure, in which several shareholders took part,

Mr. FOXALL inquired for what purpose the £5000 which the chairman referred to was wanted.

The CHAIRMAN replied that it was wanted for new works, which were constantly called for to meet the increasing business of the company. They could not do without new gasholders, retorts, and other apparatus, from time to time, and they had no capital with which to provide them.

Mr. H. P. STEPHENSON said in the city of Ely, last year, the company were sending out 75,000 cubic feet of gas daily, with gasholder room equal only to 25,000 cubic feet. He advised the directors that it would not be safe to go through another winter without further gas storeage. The new gasholder and tank erecting there would cost about £1100.

The CHAIRMAN said the question of economizing expenditure had been under the serious consideration of the board, and they had lately taken steps to give practical effect to their deliberations. The suggestions which had been thrown out by the shareholders would not be lost sight of, and probably before the next meeting something would be done in reference to them.

The motion for the adoption of the report was then put, and carried; and a vote of thanks having been given to the chair, the proceedings closed.

NOVEL EXPERIMENT IN CLEANING CORRODED WATER-MAINS.—An experiment of an important kind has just been tried on the Torquay water-mains, which had become so greatly oxidized as to interfere seriously with the flow of the water. It was resolved to try the late Mr. Appold's invention for ridding the mains of the incrustation. The machine consists of an iron bar two inches in diameter, and four and a half feet long. At one end are secured a series of strong iron springs, the ends of which are sharpened, and press outwards; at the other end is a piston, securely packed with leather. This apparatus being inserted into the main, the water is drawn off in front, and turned on behind; the pressure then propels it through the pipe. The experiment was tried a few days ago on Knighton Heath, four miles from Hennock, on a section of 1566 yards. A pressure of five tons was brought to bear on the piston-head, and the machine struggled and tore through the main, and did its work admirably, so much so as to warrant the local board in applying the scraping process to the whole length of the main, 14 miles. From the 1500 yards of pipe submitted to the action of the scraper, not less than three tons of rubbish and oxide were removed.

OPENING OF WISBEACH WATER-WORKS.—The new Wisbeach Water-Works were opened on Wednesday last, with great demonstrations of rejoicing, by Lord R. Montagu, M.P. The water is brought from Marham, and the outlay on the works has been over £22,000. A luncheon was served in the Corn Exchange, Wisbeach, at which the mayor presided, and at which the usual toasts were duly honoured. The procession was then formed, and proceeded to the market-place, where the inaugural ceremonies were performed, Lord R. Montagu addressing the assemblage on the occasion. As a part of the inaugural rejoicings, a *conversazione* was held in the Town-hall on Thursday night, and on Friday there was a grand display of fireworks in the market-place.

RESEARCHES ON THE VOLATILE HYDROCARBONS.

By C. M. WARREN.

[From the *Memoirs of the American Academy* and *Silliman's Journal.*]

Introductory Remarks.—While engaged, a few years since, in attempting to separate some of the constituents of coal-tar naphtha by the common process of fractional distillation, I was forced to the conviction that that process could not be safely relied upon for anything like a complete and accurate analysis of such a complex mixture of liquids; and that, at best, the products thus obtained could not be regarded as anything better than remote approximations to pure substances; leaving reason to fear that there might still be other bodies present, in less quantities, perhaps, which had escaped detection.

An examination of the results of previous researches on tars, petroleums, &c., served in general to confirm the impressions induced by my own less extended experiments; and to increase, rather than lessen, the doubts already existing in my mind as to the trustworthiness of the results which had hitherto been published concerning the neutral constituents of such mixtures. Influenced by these considerations, and by the belief that, if I could succeed in finding a process capable of effecting a more complete separation of the constituents of such mixtures, it might probably lead to the discovery of new bodies, lying between those which had already been described, I was led to undertake the researches the result of which I am about to record. Even if this purpose should fail, I was convinced that the expenditure of labour in isolating those bodies in a state of greater purity, would be amply compensated by the much needed confirmation, or perhaps correction, of the results previously published, in addition to the valuable incidental evidence of the absence of other bodies which would thus be furnished. The results which I have obtained in pursuit of this object are abundantly sufficient to show that I did not undervalue the work of my predecessors, nor overestimate the importance of the work before me.

The success which attended my efforts in search of a better process of separation has already been described in detail, in a memoir "On Fractional Condensation," &c.

This new process was first applied, more especially for the purpose of testing its efficiency, in the separation of benzole from coal-tar naphtha. This mixture was selected for the test on account of the property which benzole possesses, in contradistinction from its associates, of being crystallizable at a low temperature, thus affording an additional test of the purity of the product which might be obtained by the process of fractioning. Somewhat to my surprise I found that, after only the fifth series of fractionings, I had obtained benzole so nearly pure that the whole of it would distil from a tubulated retort between 80° and 81° C.; and that when congealed, which was effected by placing the containing bottle in pounded ice, not a drop of liquid could be poured from the mass of crystals. From this result—which, at least, indicated a near approximation to purity—taken in connexion with other favourable indications, I felt confident that I had accomplished my first object, and had found a process that could, in all probability, be successfully applied in the study of the petroleums, which up to that time (1861) had baffled every attempt to resolve them into their proximate constituents.

Being naturally anxious to apply the new process in this seemingly more promising field of inquiry, I at once suspended, for the time being, my operations on coal-tar naphtha, and commenced simultaneously the investigation of Pennsylvanian petroleum, and of the oils distilled from Albert coal (from Hillsboro, New Brunswick) in the process of manufacturing illuminating oil. These two substances, neither of which had ever been made the subject of special scientific investigation, were selected as being fair representative types, on the one hand of the native liquid petroleums, and on the other of the artificial coal oils. The comparative study of these two substances seemed to promise additional interest on account of the close analogies which they present, especially when this circumstance is considered in connexion with the fact of their great diversity of origin. This is the limit which at that time was assigned for these researches; my intention being, so soon as the separations and analyses should be completed, and the boiling-points and some of the other more important physical characteristics determined, briefly to publish the results, together with the process of fractioning—preliminary to a complete memoir at a more advanced stage of the work. Before this work had been accomplished, however, it became evident that the bodies contained in these mixtures could not be studied so satisfactorily by themselves as in comparison with other series of hydrocarbons, especially with reference to certain important questions of more general interest; for example, the question in regard to the increment of boiling-point corresponding to the addition of C_2H_2 in homologous series. It was therefore deemed advisable to extend the inquiry so as to include the naphthas from coal and wood tars, and the oil of cumin. And there are still other mixtures of hydrocarbons, that have been made the subject of previous research which must yet be brought into the works, in order to clear up, in a satisfactory manner, the confusion and obscurity that seem to exist in our publications regarding some questions relating to the different series of this class of bodies.

This digression from my original plan having caused much additional labour has necessarily delayed publication longer than was desirable, until now the results of more than three years of work have accumulated. In this connexion I may remark, so far as regards petroleum, that I had nearly completed the fractional separations—except of the bodies of high boiling-point—so long ago as June, 1862, having been for a long time occupied with this work before the appearance, in that month, of the first memoir of Pelouze and Cahours on the same subject. At that time my work was considerably in advance of theirs, and their results differed widely from mine in some important particulars; yet after the publication of their memoir I felt reconciled to a continuance of the delay which had been caused by the change of plan above mentioned, considering it due to these chemists that they should have time to complete the publication of the results of their investigations before I should publish mine. Similar remarks might be made respecting the first publication of Schorlemmer, which appeared soon after, on the products of distillation of cannel coal; this substance being so closely analogous to the Albert coal (upon the products of which I had at that time been long engaged) as to induce the belief that, under the same circumstances, either would afford the same products.

I.—ON THE VOLATILE HYDROCARBONS FROM COAL-TAR NAPHTHA, OIL OF CUMIN, AND CUMINIC ACID.

PART I.—*Hydrocarbons from Coal-tar Naphtha.*

In presenting the results of a re-examination of a series of substances upon which so much labour had already been bestowed, and upon the nature and properties of which so little doubt has seemed to exist, it may confer an interest on the subject to state briefly some of the more important results and conclusions that previous investigators have arrived at in the study of these substances.

The discovery by Faraday, (*a*) in 1825, of benzole ("bicarburetted hydro-

(*a*) *Transactions of the Royal Society*, 1825, cxv., 465.

gen") in the oil compressed from oil gas, rendered it highly probable, and indeed led this distinguished philosopher to suspect, that this substance might be found in coal-tar naphtha. His search for it, however, proved unsuccessful, it having been first detected by Hofmann in 1845.(*b*) This chemist, however, did not attempt to isolate this body, and the bare fact of its presence appears to be all that was definitely known of the composition of coal-tar naphtha prior to 1849, in which year Mansfield (*c*) published his elaborate and valuable research, being the first effort at a proximate analysis of this mixture which appears to have been attended with any considerable measure of success. Although a fatal accident, while engaged in his experiments, prevented Mansfield from completing the investigation which he had so well begun, yet the work that he had already published in an unfinished state must always be regarded as having contributed much towards a clear and definite knowledge of the nature of the neutral pyrogenous oils contained in coal-tar naphtha. Indeed, it may be said that little has since been added to our knowledge on this subject. Notwithstanding the incompleteness of his separations of the hydrocarbons, the extent to which he had carried them with the limited means employed is truly remarkable, and could not have been accomplished without an expenditure of labour, and a degree of patient endurance, which only those who have experienced the tediousness of such operations can appreciate.

Mansfield claimed to show that the light coal-tar naphtha is composed of a mixture of four distinct hydrocarbons, boiling within the range of 80° to 175° C.; and probably having the general formula $C_n H_{n-6}$. The first of these, which he found to boil constant at 80°, was proved to be identical with benzole, $C_{12}H_6$. The second, boiling at about 113°, was determined, from certain reactions, to be identical with toluole, $C_{14}H_8$. The special study of this body was deferred, however, with the remark that it had not yet been isolated in a state of sufficient purity to claim an analysis. The third body, boiling at about 140° to 145°, was said to present all the characteristics of cumole, $C_{18}H_{12}$; but this view was not founded on a careful study and comparison of the chemical or physical properties of these bodies, but was merely an expression of opinion in advance of anticipated results. Of the fourth body, boiling at about 170° to 175°, Mansfield remarks that it bears so strong a resemblance, in odour and other properties, to cymole, $C_{20}H_{14}$, as to induce the belief that this substance is identical with the hydrocarbon existing in oil of cumin. It thus appears that of the four bodies which Mansfield detected in coal-tar naphtha, benzole is the only one which he had studied in any detail. Indeed he distinctly states that the others had not yet been isolated in such a state of purity as to entitle them to analysis. And yet his conjectures as to the identity of these bodies, thrown out by way of preliminary notice of results which were acknowledged to be incomplete and inaccurate, have nevertheless been extensively quoted, and generally received as established facts. In addition to the bodies already mentioned, Mansfield also detected the presence of a body more volatile than benzole, having an alliaceous odour, which he found to boil between 60° and 70°. Ritthausen (*d*) made a re-examination of the light coal-tar naphtha, in order to obtain the hydrocarbons in a state of greater purity, and to prove the correctness of Mansfield's view of the composition of this naphtha. In regard to the results which he obtained, he says they fully confirm those of Mansfield. Of the body which Mansfield designated as probably identical with cymole, and of the oil more volatile than benzole, Ritthausen obtained quantities too small to admit of investigation. In regard to the latter, however, he remarks,(*e*) that to Mansfield's account he can add, that "its nitro-product quite resembles that of benzole, and hence that at all events it belongs to the series C_nH_{n-6}, and perhaps has the formula $C_{16}H_4$." (*f*) It is to be regretted that Rittbausen also omitted to analyze and determine the vapour density of any one of these substances, he having added, therefore, nothing more than a confirmation of the results of Mansfield. He gives the boiling-point of benzole at 80°, of toluole at 109°, and of the so-called cumole at 139°-140°, which will be found to agree very nearly with my own determinations. Church, (*g*) in the following year, published a paper on the "Determination of Boiling-points" in the "Benzole Series." I cannot better present his results than by quoting the following table:—

	Formula.	Boiling-point.	Difference.
Benzole,	$C_{12}H_6 = C_6\,3\,(C_2H_2)$	80°·8	
Toluole,	$C_{14}H_8 = C_6\,4\,(C_2H_2)$	103°·7	22°·9
Xylole,	$C_{16}H_{10} = C_6\,5\,(C_2H_2)$	126°·2	22°·5
Cumole,	$C_{18}H_{12} = C_6\,6\,(C_2H_2)$	148°·4	22°·2
Cymole,	$C_{20}H_{14} = C_6\,7\,(C_2H_2)$	170°·7	22°·3

Church states that he obtained all of these bodies from coal naphtha, and also that he obtained benzole from benzoic acid, toluole from toluylic acid, xylole from woodspirit, cumole from cuminic acid, and cymole from oil of cumin; and that he has found the corresponding bodies from these different sources to be identical. It will be observed that Church claims to have found in coal tar a body boiling at 126°·2, which he calls *xylole*, thus supplying from this source a fifth member of the benzole series; whereas Mansfield and Ritthausen found only four bodies within the range of temperature indicated by the table. It will also be observed that his determination of the boiling-point of toluole is much lower, and that of cumole much higher, than the corresponding determinations of Mansfield and Ritthausen; thus giving room for a middle member between them, and preserving a remarkable uniformity of difference—viz., 22° and a fraction—between the boiling-points of any two contiguous members of the series, for the addition of C_2H_2.

That the earlier investigators had found in coal-tar naphtha only the two lower members ($C_{12}H_6$ and $C_{14}H_8$) and the two upper members ($C_{18}H_{12}$ and $C_{20}H_{14}$), indicating the absence of the middle member ($C_{16}H_{10}$) of the benzole series, was always to me an anomaly which I could not reconcile with any plausible theory in regard to the formation of these bodies; and I was led, therefore, to question whether this body had not been overlooked in making the separations. The alleged discovery of this body in coal naphtha by Church, together with the beautiful uniformity of the boiling-point difference throughout the series which he presented, and the apparent care with which the whole research had been conducted, led me to regard his results as being more reliable than those which had been previously published. I remained under this conviction until I had discovered the boiling-point difference of 30° in other series of hydrocarbons, (*h*) which led me to doubt the accuracy of Church's determinations of boiling-points, and to consider those of Mansfield and Ritthausen as probably more correct.

In the first paragraph of his paper, Church remarks that, "although doubts still remain as to the relations of these bodies one to another, yet their composition has been ascertained with certainty." It does not appear, however, that an analysis or vapour density of any one of the members of this series, as obtained from coal tar, except benzole, had ever been published.

As already indicated by the title of his paper, it appears to have been the design of Church to treat only of the boiling-points of these bodies; yet finding that his preparations of toluole—prepared both from coal naphtha and toluylic acid—gave a boiling-point differing considerably from observations previously published, he took occasion to make analyses of his preparations of this substance, which he regards as "perfectly satisfactory;" and adds that "the details and numerical results of these analyses, and of many others which the present inquiry necessitated, the limits and special object of the present paper do not admit of my giving here." As he undertook to correct the work of his predecessors, to do which fairly would seem to require the publication of these "details and numerical results," their omission is to be regretted, the more since he found space and purpose for matter apparently less relevant to his special subject. I am prompted to these remarks from having been led to undertake the tedious task of making a re-examination of coal-tar naphtha mainly on account of the disagreement between Church's determinations, which I have found to be mostly incorrect, and those which had been previously published.

In addition to the bodies mentioned in the foregoing table, Church alludes to the discovery of two other bodies, boiling respectively at 97° and 112°. Subsequently, in a "Note on Parabenzole, a new Hydrocarbon from Coal Naphtha," (*i*) he publishes the details of an investigation of the former of these two bodies, which he finally found to boil "*perfectly constant at* 97°-5," and to be isomeric with benzole.

I think I shall be able to show in the following pages—

1. That coal-tar naphtha contains only four hydrocarbons within the range of 80° to 170°, as taught by Mansfield, and confirmed by Ritthausen.

2. That the benzole series within that range of temperature is limited to four members, and therefore does not contain five, as has been generally supposed.

3. That these four members have the boiling-points 80°, 110°, 140°, and 170° respectively; and consequently that the boiling-point difference in this series, for an elementary difference of C_2H_2, is 30° instead of 22° and a fraction as alleged by Church.

4. That the body obtained from coal-tar naphtha, boiling at 140°, is not identical with cumole from cuminic acid, as assumed by Mansfield, nor even isomeric with it; but that it has the formula which has been assigned to xylole, containing C_2H_2 less than that of cumole.

5. That the body obtained from coal-tar naphtha, boiling at 170°, is quite a different body from cymole obtained from oil of cumin—with which it has been considered identical, as assumed by Mansfield—these bodies differing from each other by C_2H_2.

6. That cumole from cuminic acid, and cymole from oil of cumin, do not even belong to the benzole series.

7. That the parabenzole of Church was in all probability only a mixture of benzole and toluole.

Of the Quality of Naphtha employed in this Investigation.—As I have taken occasion to question the existence in coal-tar naphtha of two of the substances which it has been said to contain—viz., cymole, $C_{20}H_{14}$, and parabenzole, $C_{12}H_6$—it is a matter of some importance that I should clearly state the kind or quality of the naphtha employed. The tar from which this naphtha was obtained was a mixture of the tar furnished by the following companies—viz., the New York and the Manhattan Gaslight Companies, of New York; Brooklyn Gaslight Company, of Brooklyn, N.Y.; Albany Gaslight Company, of Albany, N.Y.; and the gaslight companies of Newark and Jersey City, in New Jersey. It was mostly made from cannel and Newcastle caking coals, which were imported from Liverpool, and mixed in the proportions of one-third to five-eighths cannel to two-thirds to three-eighths Newcastle. In some of the works a portion of the caking coal was from mines in Pennsylvania. The tar from these different gas-works, as regularly received at the naphtha manufactory, was poured into a large tank provided for this purpose. The stills were uniformly charged with tar directly from this tank, so that there can be no doubt that the naphtha employed was made from a mixture of the tar supplied by the six different companies above enumerated. Most of the gas-works referred to are large, the annual production of tar amounting in the aggregate to upwards of 50,000 barrels. It does not appear, therefore, that the absence of the bodies in question from the naphtha which I have employed can be attributed to any peculiarity of the tar. The naphtha was prepared in a manufactory in New York over which I had at that time personal control, and was purified under my own direction. The process of purification did not differ essentially from that in common use in England, the reagents employed being oil of vitriol and alkali. One hundred barrels of the purified naphtha were subjected, under my personal superintendence, to repeated fractional distillation from an iron still. The chief object in operating on so large a quantity was to ensure the detection of any constituent which might be present in small proportion. The process of fractioning was continued on this large scale until the separations had so far progressed that at certain temperatures a full barrel of distillate would come off from the 10-barrel still employed, without a variation of more than one or two degrees of the thermometer. Finally, a sample gallon was taken from each of the barrels composing the last series of products, and these samples were set aside for this investigation, which was afterwards conducted in the laboratory.

Of the Results of Fractional Condensation.—Such of the samples above mentioned as promised to yield the different constituents of the naphtha in the largest proportion were subjected to repeated series of fractioninga by my process of "Fractional Condensation." (*k*) As full details of this process have already been given in the memoir referred to, it will be needless to repeat them here. It will suffice to say that the fractioning in this case was conducted in all respects as there described, and continued until the whole of the naphtha taken, boiling between 80° and 170°, had accumulated at the four points already indicated—viz., at 80°, 110°, 140°, and 170°; or so nearly the whole that the intermediate quantities had become too small to admit of being further operated upon. Having, therefore so thoroughly exhausted the intermediate fractions, I can have no hesitation in asserting that no other

(*b*) *Annale der Chemie und Pharmacie*, 1845, lv., 200.
(*c*) *Quarterly Journal of the Chemical Society*, 1849, i., 244.
(*d*) *Journal für praktische Chemie*, 1854, lxii., 74.
(*e*) "Ich kann den Angaben von Mansfield über das letztere nur das hinzufügen, das seine Nitroproducte denen des Benzols, &c. ganz ähnlich sind, daher es jedenfalls der Reihe C_nH_{n-6} angehört und vielleicht die Formel $C_{16}H_4$ besitzt."
(*f*) On a future occasion I shall show that Ritthausen was in error in placing this body in the benzole series, and indeed in considering it as a hydrocarbon at all. He was evidently deceived by operating on a mixture containing benzole. Furthermore, as Mansfield suggested might be possible, that part of the naphtha more volatile than benzole is by no means composed of a single substance. Having had a large quantity of this volatile material at my command, I have been able to obtain the separate constituents apparently in a state of great purity. Of the two bodies separated, one of them boils constant at about 40°, and the other near 0°. Both are compounds containing sulphur, and therefore will more properly form the subject of a separate paper.
(*g*) *Philosophical Magazine*, 1855, [4], ix., 256.
(*h*) See a following Memoir on this subject.
(*i*) *Philosophical Magazine*, 1837, [4], xiii., 415.
(*k*) *Memoirs of the American Academy*, 1864, and last vol. of *Silliman's Journal*.

body than those alluded to was present in the naphtha—at least in appreciable quantity—hence, that the parabenzole of Church was probably only a mixture of benzole and toluole. I may here remark that each of the sample gallons employed, when subjected to my process of fractioning, was found to contain, in variable proportion, all of the constituents of the naphtha.

Of some of the Properties of the Bodies obtained by Fractioning.

1. Benzole.—Specific gravity, 0·8957 at 0°, and 0·882 at 15°·5. (*l*)

Determination of Boiling-point.—This experiment was conducted in a tubulated retort, operating on 150-200 c. c. of the benzole, containing some pieces of sodium. The benzole employed had previously been repeatedly boiled with sodium, until the latter ceased to have any action. The thermometer bulb extended into the liquid (*m*) nearly to the bottom of the retort. A second thermometer was attached, by means of flexible bands, to the side of the one in the retort; the bulb being placed, during ebullition, at a point midway between the centre of the cork (—5°) and the upper end of the mercurial column—viz., at 35°. A paper screen, closely fitting the thermometer spindle, was placed across at the top of the cork. With the retort neck slightly inclined upward, and cooled to prevent the escape of vapour, ebullition was continued for a considerable time, until the mercury in the thermometer ceased to rise. The lamp being removed for the moment, the neck of the retort was then turned downward, and quickly inserted in a Liebig's condenser. On replacing the lamp, distillation commenced almost immediately at 79°.

Observations.—

Temperature.		Time. h. m.		Temper. by side therm.
79·0	at	2.40		
79·2	,,	2.45	5 minutes.	22°
79·4	,,	3.00	15 ,,	24°
79·5	,,	3.12	12 ,,	25°
79·6	,,	3.32	20 ,,	26°
79·6	,,	3.50	18 ,,	26°

Distillation, therefore, occupied one hour and ten minutes, during which time the thermometer rose only 0°·6, being fifty minutes in rising 0°·2 from 79°·4 to 79°·6, at which temperature it had distilled nearly to dryness. Height of the barometer during the experiment reduced to 0°=761·9mm. Taking 79°·4, this being the average of the last five observations, and applying the corrections for the upper column of mercury, and for atmospheric pressure, according to the directions given by Kopp, (*n*) we find the corrected boiling-point of benzole to be 80°·1.

Analysis.—0·2339 grams of benzole gave, by my process (*o*) of combustion in a stream of oxygen gas, 0·7903 of carbonic acid, and 0·1683 of water.

		Calculated.		Found.
Carbon,	C_{12}	72	92·31	92·15
Hydrogen,	H_6	6	7·69	7·99
		78	100·00	100·14

Determination of Vapour Density.—

Temperature of balance,	15°
Temperature of oil bath,	171°
Height of barometer,	764·1mm at 9°
Increment of balloon,	0·2447
Capacity of balloon,	265 c. c.
Density of vapour found,	2·688
Theory, $C_{12}H_6$=4 volumes,	2·698

2. Toluole.—Specific gravity, 0·8824 at 0°, and 0·872 at 15°.

Determination of Boiling-point.—The preparation employed for this determination had also been repeatedly boiled with sodium until the latter ceased to have any action upon it. Operating in this case also upon a pretty large quantity, the distillation occupied about an hour. The experiment was conducted as detailed under the head of benzole. Distillation commenced at 110°·6; two minutes later, the temperature had fallen to 110°·4, at which point it remained absolutely constant during the lapse of forty-eight minutes. Five minutes later the temperature had risen again to 110°·6; and five minutes later to 110°·8, at which point, having distilled nearly to dryness, the operation was suspended. The corrections for pressure (—0·16) and for the upper column of mercury—which with the thermometer used in this experiment, was only 7° in length,—gives 110°·3 as the corrected boiling-point of toluole. Church (*p*) remarks that toluole, when distilled in the ordinary manner, is liable to become oxidized, and its boiling-point thereby raised, in consequence of the upper part of the retort becoming heated above the boiling-point of toluole. He found that toluole which, by ordinary distillation, had come over between 108° and 109°, would distil eight-tenths between 103° and 104°, after repeated purification with sodium. I would therefore state that my preparation of toluole was never subjected to a temperature above its boiling-point; and that I have never noticed any reduction of the boiling-point of this body by purification with sodium.

Analysis.—0·1628 gram of toluole gave, by combustion in a stream of oxygen gas, 0·5447 of carbonic acid, and 0·1315 of water.

		Calculated.		Found.
Carbon,	C_{14}	84	91·3	91·20
Hydrogen,	H_8	8	8·7	8·97
		92	100·0	100·17

Determination of Vapour Density.—

Temperature of balance,	17°
Temperature of oil bath,	209°
Height of barometer,	760·1mm at 15°
Increment of balloon,	0·287
Capacity of balloon,	249·5 c. c.
Density of vapour found,	3·2196
Theory, $C_{14}H_8$=4 volumes,	3·1822

3. Xylole (*Cumole of Mansfield and Ritthausen*).—Specific gravity, 0·878 at 0°, and 0·866 at 15°·5.

Determination of Boiling-point.—This determination was made in all respects like that of benzole, the xylole employed having been also subjected to the same treatment. The quantity operated upon was, however, smaller, and the experiment conducted more rapidly. Distillation began at 138°·6, and terminated at 139°, having distilled almost to dryness. The time occupied was 17 minutes. Taking the average of these observations, viz: 138°·4, and applying the customary corrections, we find 139°·8 to be the corrected boiling-point of xylole.

Analysis.—0·1333 gram of xylole gave, by combustion in a stream of oxygen gas, 0·4413 of carbonic acid, and 0·1185 of water.

		Calculated.		Found.
Carbon,	C_{16}	96	90·57	90·29
Hydrogen,	H_{10}	10	9·43	9·87
		106	100·00	100·16

Determination of Vapour Density.—

Temperature of balance,	16°·5
Temperature of oil bath,	207°·5
Height of barometer,	760mm at 14°
Increment of balloon,	0·3528
Capacity of balloon,	228 c. c.
Density of vapour found,	3·7517
Theory, $C_{16}H_{10}$,	3·6665

These results show clearly that this body has the formula $C_{16}H_{10}$, and that it is doubtless the third member of the benzole series. (*q*) Although xylole, first discovered by Cahours in the oil separated from wood-spirit, has had a much lower boiling-point assigned to it, I have retained that name for this body, since the results which I have obtained in the study of the light oil from wood tar indicate that when the corresponding body from this source is in a state of equal purity, its boiling-point will agree with the above determination. I may here mention that in my researches on the light oil from wood tar I have obtained a body at about 140°, but nothing between that and 110° (these temperatures are not corrected), although special pains were taken to work up the intermediate fractions. So that I am in a position to justify the assertion that no other body was present in appreciable quantity between the temperatures mentioned.

That this body from coal-tar naphtha, boiling at 140°, is not identical with cumole from cuminic acid, will be made apparent on comparison of the results above stated with those which will be given when treating of cumole.

4. Isocumole (*Cymole of Mansfield*).—Specific gravity, 0·8643 at 0°, and 0·853 at 15°.

Determination of Boiling-point.—This was conducted with the usual precautions, and under conditions similar to those detailed above. The distillation, as in the foregoing determinations, was continued nearly to dryness, and occupied twenty-five minutes. Before distillation was commenced, the temperature of the boiling liquid was found to be 166°·5, and at the close of distillation 167°. Applying the customary corrections to the average of these observations, viz.: 166°·75, we obtain for the corrected boiling-point 169°·8.

Analysis.—0·1944 gram of the substance gave, by combustion in a stream of oxygen, 0·6366 of carbonic acid, and 0·1896 of water.

		Calculated.		Found.
Carbon,	C_{18}	108	90·00	89·31
Hydrogen	H_{12}	12	10·00	10·84
		120	100·00	100·15

Determination of Vapour Density.—

Temperature of balance,	13°·5
Temperature of oil bath,	241°·0
Height of barometer,	769·5mm at 9°
Increment of balloon,	0·4206
Capacity of balloon,	239 c. c.
Density of vapour found,	4·3019
Theory, $C_{18}H_{12}$,	4·151

Hence it appears that the calculated density on the formula $C_{18}H_{12}$ is 0·151 *less* than that found by experiment. The calculated density on the formula $C_{20}H_{14}$, which has previously been assigned to this body,—although, as above stated, without an analysis or determination of vapour density,—is 4·645; which is 0·302 *greater* than that found by experiment. It will be observed that the difference between the density found and that calculated on the formula $C_{20}H_{14}$ is not only more than twice as large as the corresponding difference calculated on the formula $C_{18}H_{12}$, but that the error is reversed; being with $C_{20}H_{14}$ a *deficiency*, while with $C_{18}H_{12}$ it is an *excess*. This circumstance has to my mind a good deal of significance, as it goes strongly to show that the lower formula is the true one. For of the many vapour densities of hydrocarbons which I have determined, I have but rarely met with an instance in which the density found was not greater than the theoretical density. And I have usually observed that the excess of the ex-

(*l*) It would appear that the specific gravities of liquids are usually determined at the temperature of the air. The result of this is that the determinations made by different observers are not comparable with one another. That these specific gravities are not uniformly taken at 0° C.—the temperature which, on account of greater convenience, &c., is generally acknowledged to be preferable—is probably due to the fact that the more common specific gravity bottle is not suited to this purpose. Indeed, with a volatile body, that bottle cannot serve for an accurate determination at any temperature. A reform in this regard being highly desirable, I would call attention to a specific gravity bottle which I obtained a few years ago from Fastré, in Paris, which is admirably adapted for taking specific gravities, even of volatile liquids, at a low temperature. The accompanying figure represents this bottle one-half its natural size. Who was the author of this particular form I am not informed, although it may have been already noticed in some publication. A bottle analogous to this is figured by Schiel ("Einleitung in das Studium der organischen Chemie," page 76); but his bottle has an oval bottom, which makes it less convenient. The particular advantage of this bottle over the more common one, which advantage Schiel omits to notice, consists in this: that the space or chamber above the line on the capillary neck is large enough to allow for the expansion of the liquid consequent upon the elevation of the temperature from 0° to that of the surrounding air; and that the ground stopper fits so closely that no perceptible loss from evaporation can take place during the time occupied by an experiment.

In order to furnish determinations of the specific gravities of the bodies to be treated of in these researches, which shall be comparable with corresponding determinations by other observers, I shall generally record one or more special determinations made for this purpose.

(*m*) For critical remarks on the question of propriety of placing the thermometer bulb in the liquid, &c., and for further details of the method of taking boiling-points, especially at low temperatures, see a following memoir, "On the Influence of C_2H_2 on the boiling-points in Homologous Series of Hydrocarbons," &c.

(*n*) *Poggendorff's Annalen*, 1847, lxxii, 38.

(*o*) *Proceedings of the American Academy*, 1864, p. 251, and *Silliman's Journal*, xxxix., 326.

(*p*) *Philosophical Magazine*, 1855, [4], ix, 256.

(*q*) As this memoir is passing through the press, the receipt of my journals for September calls attention to late publications of Hugh Müller, Bechamp, and Naquet concerning this hydrocarbon. Müller concludes that it is xylole, a result which agrees with my own. (*Annalen der Chemie und Pharmacie*, 1864, cxxxi, 321.) Bechamp, on the contrary, erroneously regards it as being a *new* hydrocarbon, not belonging to the benzole series. (*Bulletin de la Société Chimique*, Paris, 1864, 204.) Naquet calls it a *new* hydrocarbon, and gives it the formula $C_{18}H_{12}$. (Ibid, p. 205.)

perimental over the theoretical density is larger in proportion as the boiling-point of the body is higher, a fact which needs explanation. Wurtz (*r*) observed a similar difference between the determined and calculated vapour densities of bodies of the formulæ C_nH_n and C_nH_{n+2}, which he accounted for on the ground that his preparations contained an admixture of bodies less volatile, the vapours of which would remain in the balloon, and increase the density. But I cannot accept this explanation for the substances here treated of, since they invariably distil without residue within a range of one degree of temperature. I would rather rely upon the supposition that the high temperature employed causes partial decomposition of the substance, which would be the more liable to occur the higher the boiling-point of the body. I do not, however, offer this as an explanation, but merely make the suggestion.

(*r*) *Bulletin de la Société Chimique de Paris*, 1863, 309.

PROPOSED UTILIZATION OF SEWAGE AT PRESTON.—A plan is on foot for utilizing the sewage of Preston. Mr. Newton, C.E., the borough engineer, has just published an elaborate report on the subject. After referring to the plans which have been adopted at Edinburgh, Carlisle, Rugby, Croydon, &c., he arrived at the following conclusions:—1. That town sewage cannot be profitably utilized by deposition, filtration, or precipitation, and that none of the methods hitherto adopted under this system have effectually accomplished the dispollution of streams into which the effluent waters are discharged.—2. That town sewage, when applied in irrigating the land, has invariably realized profitable results, and that the waters discharged from such lands, after irrigation, are so far deprived of their manurial constituents as to be rendered practically innocuous.—3. That, when judiciously applied, liquid sewage does not give off offensive emanations, but is immediately deodorized by the soil.—4. That the value of liquid sewage varies according to the degree of dilution, the quantity applied, and the nature of the land upon which it is applied.—5. That the actual value of sewage upon the land, as realized on the Lochend and Craigentinny Meadows, at Edinburgh, is about three-fourths per ton, the quantity applied—injudiciously, it is believed—being about 8500 tons per acre per annum. That the value realized at Croydon, in applications of diluted sewage, amounting to 4170 tons per acre per annum, is 1½ per ton, representing, however, 6s. for each individual contributing to the sewage, That the value per ton realized by the Royal Commission at Rugby represents ½d. for large applications of 9000 tons per acre, and nearly 1d. per ton in moderate dressings of 3000 tons per acre.—6. That good grass is encouraged and not destroyed, as sometimes asserted, by judicious applications of town sewage. Also, that cattle prefer sewaged to unsewaged grass, and that the fattening and milk-producing qualities of sewaged grass are very little inferior to unsewaged grass. Mr. Newton then suggests that the sewage of Preston should be appropriated at the marsh end, below the town, near the junction of two mains which drain the entire borough; that from this point it should be forced by an engine of 40-horse power, through iron pipes 20-inch diameter, to the marsh lands at Clifton, a few miles lower down; that at short intervals there should be openings fitted with sluice-valves for the purpose of supplying sewage to the districts traversed through. The sewage would be distributed from the hydrants attached to smaller mains by means of carriers or gutters, and it is believed that no nuisance whatever would result from their operations. The estimated cost of the works, including land, is £73,000, the annual expenses £5403, and the annual expense per acre would be £5. 6s. 8d. The sewage available amounts to 2,000,000 gallons per day, or 3,281,000 tons per annum. Deducting from this 50 days supply for waste in heavy rains and during repairs of works, &c., there would be 2,800,000 tons per annum available for irrigation. If no sewage is sold to landowners along the line of pipes, 3230 tons will be annually applied to each acre of land appropriated. The immediate effect on rivers, says the report, would be the dispollution of the river Kibble diverting therefrom upwards of 5000 tons of solid sewage, which, under the present system, is annually deposited in the bed of the stream. The probable results of the undertaking, in a pecuniary point of view, would be the realizing of a revenue, clear of all expenses, of upwards of £7500 per annum, representing a reduction in the rates of nearly 1s. in the pound per year.—*The Engineer.*

THE NEW WATER SUPPLY AT HAWICK.—Friday, the 22nd ult., was

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano . .	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited) . .	20 0 0	£5 intr.	17 to 17½
1000	20	Do., preference .	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited) .	5 0 0	£5 intr.	5⅝ to 5¼
10000	5	Do., second issue	4 0 0	£5 intr.	4 5 0
10000	5	Do., third issue .	2 0 0	£5 intr.	2¼ to 2⅜
5000	20	Brit. Provincial L.	20 0 0	7 10 0	30 to 30½
8200	20	Do., new . . . . (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	75 0 0
6000	50	Do.	30 0 0	10 0 0	45 0 0
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	31 10 0
10000	10	Do., B shares	10 0 0	4 0 0	7 5 0
8000	10	Do., new shares.	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L) Colonial & General	5 0 0	£7 intr.	3¼ to 4
17490	25	*Commercial* . . .	25 0 0	10 0 0	44 10 0
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union.	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	10 2 6
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17½ to 18½
5000	10	Do., preference .	10 0 0	6 0 0	12¼ to 13

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per share.
	£		£ s d	£ s d	£ s d
4000	50	*Equitable*	50 0 0	10 0 0	83 to 84
4000	25	Do., new shares.	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.) .	10 0 0	10 0 0	13 10 0
12000	10	Do., new shares. (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6⅞ to 6⅞
20000	10	*Great Central Gas Consumers* . . .	10 0 0	10 0 0	16 7 6
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	81¾ to 82
1300	100	Do., bonds . . .	£100	10 0 0	197 to 198
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	93 10 0
3000	40	*Independent* . . .	40 0 0	10 0 0	65 to 67
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6886	50	*London*	50 0 0	10 0 0	79 10 0
5519	25	Do., 1st pref. .	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref. .	50 0 0	6 0 0	
219	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sh.		6 0 0	
11828		Do., 2nd pref. sh.		5 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
12000	5	Malta & Medit. (L.)	5 0 0	2 10 0	
30000	5	Oriental, Calcutta	5 0 0	8 0 0	5 17 6
30000	5	Do., new shares.	0 10 0	8 0 0	0 12 6
10000	5	Ottoman (Limited)	5 0 0		3⅞ to 4⅛
10000	10	Parà (Limited) . .	10 0 0	£5 intr.	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 10 0
3600	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	35 to 37
20		Rio de Janeiro (L.)	20 0 0		20 to 20¼
4138	5	Singapore (Lim.) .	5 0 0		
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4000	50	*Sth. Metropolitan*	50 0 0	10 0 0	83 10 0
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15⅞ to 16
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General . . (Dublin & Limerick)	50 0 0	4 12 0	35 5 0
10000	10	*Victoria Docks* . .			16¾ to 17
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares.		7 10 0	
20000	10	Western (Limited) A shares.	10 0 0	10 0 0	16¾ to 17
10000	10	Do., B shares.	5 0 0	10 0 0	8 10 0
10000	10	Do., C shares.	3 0 0	10 0 0	5 10 0
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.) . . .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 18 0	2 12 6	3 5 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 9	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s. 9d
Cork	9s. 6d. to 10 0
Dover, Folkestone, and Ramsgate	6 9
Dublin	10s. 6d. to 10 6
Exeter Quay	8 6
Ipswich	6 0
London (from Leith)	8 6
London (Pool)	6s. 9d. to 7 0
Lowestoft and Yarmouth	5 0
Portsmouth and Southampton	8 6
Plymouth	8s. 3d. to 8 9
Shoreham	7s. 6d. to 8 0
Whitstable	7 3
Weymouth	8 3

Foreign.—Per Keel:—

Barcelona	£24. 15s. to £25 0
Bordeaux	£16. to 15 10
Boulogne and Calais	£8. 15s. to 9 5
Cadiz	17 0
Copenhagen	£9. to 10 0
Genoa	23 0
Hamburg	£9. 15s. to 10 0
Havre de Grace	11 0
Leghorn	23 0
Lisbon	16 10
Rotterdam	£9. to 9 10
Stettin	10 10
Trieste	£21. to 22 0
Venice	24 0

SUNDRIES.

Best Natle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 0
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	85 0 0
English Pig Lead, p. ton	20 10 0
English Block Tin, p. ton	92 0 0
Banca, p. ton	92 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

the occasion of general rejoicing in the town of Hawick, consequent on the opening of new works for supplying the town with water, the laying of the foundation-stone of a new exchange, and a grand banquet in honour of the Duke of Buccleuch. The proceedings commenced in the forenoon by a procession being formed at Hawick for the purpose of accompanying his grace to the point of the Allan Water, about five miles from Hawick, from which the additional water supply for the town is to be obtained. The party, conveyed in about sixty carriages, reached the reservoir shortly before one o'clock, and advantage was taken of the opportunity by the Town Council to present his grace with an address expressive of gratitude for his kindness in allowing the water to be taken from the river free of charge, and also permitting it to be taken through his property without any further cost than payment of compensation to tenants for such surface damage as they may have sustained from the laying of pipes. Other proprietors through whose grounds the tubes have been laid also granted the same privilege to the town. His grace having replied to the address, the Rev. Dr. M'Rae, of Hawick, offered prayer, and his grace unlocked the sluice, through which the water rushed into the reservoir amid the loud cheers of the spectators. On the procession returning to the town another was formed for the purpose of proceeding to the exchange and laying the foundation-stone. This ceremony was performed with all due masonic honours, the stone being laid by the most worshipful grand master of Scotland (Mr. J. Whyte Melville), who was accompanied by representatives from twenty different lodges. His grace the Duke of Buccleuch, in the course of the proceedings, handed over to the directors of the exchange the free charter of the site so far as it belonged to him. His grace has also been a liberal contributor to the undertaking. In the evening a grand banquet in honour of the Duke of Buccleuch was held in a pavilion, and was attended by between 300 and 400 gentlemen, including, along with his grace, the provost of Hawick, who occupied the chair, Lord Napier, Sir William Scott, M.P., the most worshipful grand master of Scotland, Mr. Adam Black, ex-M.P., Mr. R. Hodgson, ex-M.P., and many of the landed proprietors of the district.

Fatal Explosion of Naphtha in Sheffield.—On Friday afternoon an inquest was opened in Sheffield, on view of the body of Harriet Rodgers, aged 28 years. The deceased, who was housekeeper to Mr. Frederick Timm, silver plater, Regent Street, had, on Monday morning last, accompanied by Mr. Timm, gone into the cellar for the purpose of putting naphtha into a gas carburator, which is attached to the meter. When in the act of filling the vessel an explosion took place, by which Mrs. Rodgers and Mr. Timm were shockingly burned, and Mrs. Rogers died on Thursday morning. The coroner stated that in consequence of the dangerous state in which Mr. Timm was at present, the inquest would be adjourned till Thursday. Mr. Smith, agent for the Gas Improvement Company, attended and explained the patent apparatus by which the accident happened. It is a vessel which is placed beside the meter, through which the gas has to pass for the purpose of being carburetted, and which has to be filled with naphtha at stated times. It is supposed that the gas had not been turned off when the explosion took place.—*Manchester Courier.*

Explosion of Gas at Torquay.—Much consternation was felt in Torquay on the evening of Sunday, the 24th ult., in consequence of the occurrence of a very alarming and dangerous explosion of gas. A quantity of gas had escaped from the main to the common sewer in Higher Union Street. Whether by accident or design is not known, but suddenly it exploded with a terrific report, blowing up a part of the pavement. The force of the explosion was transmitted through the drains leading to the houses on both sides, and in some cases the water-closet pans were smashed, besides doing other damage. The scene of the accident is immediately opposite the parish church of Upton, and the explosion caused much dismay amongst the congregation. By the desire of the minister, the Rev. R. R. Wolfe, the gas was put out, but as minor explosions followed in rapid succession, the people became greatly alarmed, and he dismissed them.—*Western Morning News.*

Cornish Pumping-Engines.—In the month of July, 31 pumping-engines consumed 1913 tons of coal, and lifted 13·9 million tons of water 10 fathoms high. The average duty of the whole was 48,900,000 lbs. lifted 1 foot high by the consumption of 112 lbs. of coal. Ten engines exceeded the average duty.

Cannel Coal and Coal-Oil Manufacture in Australia.—Considerable attention is now being directed to the Hartley cannel coal of New South Wales, an excellent seam 5 feet thick being now worked in the county of Cooke, from which they are extracting kerosene and crude oil. They are now erecting extensive works at Hartley for carrying on the manufacture on a large scale. We have been favoured by Mr. John Mackenzie, the Government Examiner of Southern Coal-fields, with a specimen of the mineral, which, in ordinary working, yields an average of 140 gallons to the ton. The same gentleman also sends us a sample of what the local geologists designate kerosene shale, or schist. It is obtained from American Creek, near Wollongong, New South Wales, and the owner of the shale land is now erecting works for the purpose of extracting the oil contained. The seam where proved is about 18 inches in thickness, and the average yield of the shale is about 50 gallons of crude oil to the ton. The ordinary coal trade is still in a fair position, inasmuch as the New South Wales obtains more favour as it becomes more known; but at present there is a temporary dulness, owing to the supply being greater than the demand.—*Mining Journal.*

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

CLASSES X. & XXXI.

"George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	,,	,,	,,	2·812.
Croll, Rait, and Co.	,,	,,	,,	5·540.
Thomas Fletcher	,,	,,	,,	15·121.
Joseph Boulton	,,	,,	,,	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

LIVESEY FIRE-CLAY WORKS,
NEAR BLACKBURN, LANCASHIRE.
ORLANDO BROTHERS,
MANUFACTURER OF PATENT CLAY RETORTS,
AND EVERY DESCRIPTION OF
TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.
FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

CONTENTS.

	PAGE
Notes upon Passing Events:—	
The Report of the Children's Employment Commissioners	741
Leading Articles:—	
The Leamington Local Board and the Gas Company	743
Circular to Gas Companies:—	
Abandonment of Partial Meter Indication for Public Lamps at Kettering	745
Mr. Macnie's Report on the Working of the Corporation Gas-Works at Limerick	745
Keeling's Gas Governor	746
Correspondence:—	
Mr. Quick's Report on Constant Water Supply *versus* Intermittent Supply	746
Water Supply and Mr. Quick	747
Register of New Patents:—	
Benson, M.—Lift and Force Pumps	748
Welsh, J.—Lighting Street and other Lamps	748
Gedge, W. E.—Apparatus for Cutting Iron Pipes	748
Gregg, J. W.—Street and other Lamps	748
Applications for Letters Patent	748
Grants of Provisional Protection	748
Notices to Proceed	749
Patents which have become Void	749
Miscellaneous News:—	
Meeting of the South Metropolitan Gas Company	742
Meeting of the Commercial Gas Company	750
Meeting of the London Gas Company	752
Death of the Widow of the late Samuel Clegg	754
Analysis of the Metropolitan Water in September, 1865, by Professor Frankland, F.R.S., of the Koyal College of Chemistry	754
Meeting of the Imperial Gas Company	755
Meeting of the Surrey Consumers Gas Company	756
Meeting of the Continental Union Gas Company	757
Meeting of the Alliance and Consumers Gas Company (Dublin)	758
Meeting of the Sheppy Gas Consumers Company	759
Metropolitan Board of Works	759
Dr. Hillier's Report on the Gas supplied by the Imperial Gas Company to the Vestry of St. Pancras during the month of September	760
Sale of Spanish Gas-Works	760
Explosion of Gas at St. George's-in-the-East	760
Fatal Accident at the Alliance Gas-Works, Dublin	761
The Supply of Water in Leeds	761
Scarcity of Water in Lancashire	761
Share List of Metropolitan Gas Companies	761
Price Current	761

TO CORRESPONDENTS.

A. M. (Louth).—*We are unable to supply you with the information you desire.*

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, October 31, and the subsequent numbers on each successive alternate Tuesday.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 17, 1865.

Notes upon Passing Events.

It is extremely difficult, in a country governed constitutionally, to draw the line where official interference with private occupations should stop. According to an unquestionably sound theory, the business of Government should be confined to protecting its subjects from injury in their lawful occupations at home and abroad, and in undertaking those duties which not being within the self-interest of individuals must be performed by their rulers. But there are exceptions to this rule, and the more we study the condition of this country, the more convinced we become that no general rule can be laid down, and that each case where Government interference is claimed on one side and resisted on the other must be considered and settled on evidence, with this fixed rule—that strong cause must be shown for each new case of official action and restraint. The meetings of the British Association for the Promotion of Science and of the Social Science Society have both brought into prominent attention the condition of the children of the labouring classes, especially of those engaged in highly-paid employments. The statements made at these meetings have received additional importance from the recent publication of evidence taken before the Children's Employment Commission. It is now more than twenty years since, in spite of the violent opposition of the Radical manufacturing party, Acts of Parliament were passed restraining the employment of women and children in mines and in certain descriptions of factories. The last extension of the principle of these Acts was to the linen manufactories of Lancashire and Yorkshire; and some persons will still remember the insolence with which great factory owners resisted what they called "interference with their people," meaning any regulation that prevented them from working children twenty-four hours at a stretch. The mine owners and mill owners were just as sure that the Acts restraining the unlimited labour of women and children would ruin their trade and drive it into the hands of foreigners, as the farmers, that Free Trade would reduce England to a waste of poor grass land. The farming interest, although hit very hard by unfavourable seasons and the cattle plague, is not insolvent, and twenty years of factory regulations and a cotton famine have not clipped the enterprise of Lancashire and Yorkshire; on the contrary, the laws that forbid children to be worked for unlimited hours, and compel them practically to obtain some kind of education, have worked well for both hands and employers.

The question now pressing on the public conscience is, "How far ought we and can we extend the principle of laws "which will limit the hours of the work of children, exclude "all from work below a certain age, and encourage if not "compel all to obtain a certain measure of education." A sweeping answer cannot be given to these questions. Each trade must be tried by itself, and the judgment must take every circumstance of extenuation into consideration. For instance, however desirable it might be to insist that every child of an agricultural labourer should be able to read, write, and cipher before it gave up its little life to field-work, it would be cruel if possible, but really impracticable to carry out such a law. In the first place, in many agricultural districts the wages of the mere labourer are so low that the trifle earned by a child in bird-scaring or weeding is of serious importance to the family budget. In many cases to tell a labourer that he must keep his children at school all the year round until they are twelve years old, would be the same thing as ordering him to become a hopeless pauper. Besides, the seasons themselves limit the hours of agricultural labour. Something, however, will have to be done to restrain the abuses of the "gang" system in agriculture, where a man hires a number of children of both sexes from their parents, and takes them on a tour to execute such work as children can do, by contract; lodging his little troop of Bohemians in barns and hovels at night, paying the least possible attention to decency and the preservation of health.

The Children's Employment Commissioners have carefully investigated almost all the manufactories in which children are employed; and although every trade will be ready to prove that it is "not so bad as it seems," the general conclusion is irresistible, that parents are not to be trusted with the uncontrolled employment of their children when large wages are to be gained, and that although so much has been done for education within the last forty years, an enormous field remains untouched. English feeling revolts against the German system of compelling parents to send their children to school, and, by careful examination, almost forcing every child to read and write. Yet, when we find in districts where wages are very high, hundreds of children at work for long hours, from the tenderest years—10, 9, and even 8—without the most elementary knowledge of common things, without a change of garments, slaving for fathers who earn 30s., 40s., and 50s. a week, we feel that something must be done for the nation's sake. The case of Sheffield has excited a great deal of discussion, because it is the seat of one of our staple trades, because the Social Science Congress has been sitting there, and because it is represented by a celebrated politician and economist—John Arthur Roebuck. But there are other trades

in other towns nearly as bad as the Sheffield trades. The peculiarity of Sheffield is, that there are trades eagerly pursued, to which fathers introduce their children of tender years, and which are absolutely poisonous. Over their workshops might be written—"High wages and a short life." Children set to work at grinding at 10 years old live to be 21, if fortunate. Strong men survive to 40 years; and neither masters nor men in this intelligent Sheffield think anything of these caverns of death. There are means which would enormously diminish a death rate as fatal as typhus fever; but these means cost money, perhaps 10s. a year per man, and trouble in the shape of washing face and hands before meals and sleep. The masters are not inclined to spend money, and the men won't wash. Sheffield once had a Foreign Affairs Committee busy in corresponding with Ministers of State on the politics of Hungary and Poland. Surely this superfluous intellectual energy would find a more useful field close at home.

With this introduction we will turn to the evidence of a Blue Book more interesting than many sensation novels. The men employed in grinding forks at Sheffield work on a dry stone. This is the most distructive trade; boys begin to work at ten years old, and work ten hours a day for five days of the week. A fan is in partial use, which drives away the fine particles of steel and stone dust, and renders the work comparatively healthy. Wherever used it is put up by the men themselves. But the majority neglect and despise this essential preventive to premature disease and death. The commissioner, Mr. White, gives the evidence of the following witnesses: for brevity we give the number of each:—No. 6, age eight. Works for his father, and has been for six months grinding cast scissors. There is no fan. Can't read. "Don't know who Jesus Christ "was, or if he was a man. I've never heard about him." No. 7, age seven. Never went to school. No. 8, age 15. "Have "been at it (grinding) five years." No. 10, age six. "Grind and "glaze on the Globe wheel, with father. Don't know how long "I have been at it." This poor child's father was a drunkard, and had him at work nearly a year. No. 22, age 13. Got 3s. 6d. a week; first went to work at six years old as engine tenter—from 7 a.m. to 7 p.m. usually, some days till 8, and some days till only 6. A long and dreary list follows of boys and men, the men dying at about 30, or worn out at 40. The boys more ignorant of the world they live in than Indian savages. At work for 10 and 12 hours a day, at a fatiguing, unwholesome trade, commencing when the children of the middle classes are in the nursery, education is impossible. They know neither the name of their country nor their queen. Of religion they have not the faintest idea, but, nevertheless, they are eligible to be members of trades unions and electors for the borough of Sheffield. File-making is another of the great trades of Sheffield, and very unwholesome as at present carried on. Children begin at from 9 to 12 years old. At the end of six months, if clever, "he may earn 4s. or 5s. per week. Girls "as well as boys, if clever, at 12 or 14, may earn towards 10s. "a week." "File-cutting is very unhealthy to the belly, "causing colic, and makes the hand weak. The teeth begin to "go at 18." Mr. Alfred Ibbotson, one of a great firm of steel file makers, says: "In the Sheffield district files are made by "hand labour only. The *forging, grinding, and cutting could be "done by machinery equally well*, and at far less cost; but the "jealousy of the workmen on this point is so strong, that no "manufacturer can venture to introduce machinery for that "purpose. *It would not be safe for him to do so.*" In France excellent looking files are produced in that way almost equal in appearance, and at little more than half the price "of ours."

At the Social Science meeting of workmen, delegates denied the opposition to machinery, or the dangers from trades unions, but although the *Daily News* pretends to believe the delegates, no one who knows Sheffield would risk a file factory there to the chances of an infernal machine or improved American shell. It is a pity the Social Science managers did not let the workpeople talk; we might have learned something, if nine-tenths of the time had not been filled up by the platitudes of amateurs. Mr. "Tom Brown" Hughes showed his pluck by quoting from this "Children's Employment Blue-Book," and perhaps learned a useful lesson as to the mental condition of the object of his idolatry—the hard-working man. If the sense of the meeting had been taken as to limiting the hours of labour, and excluding all children from work under ten, and until they could read, something useful might have come out. On the question of what can be done to educate working children, Mr. G. Hurst, master of an endowed school, says—"My "experience of a school near Halifax of upwards of 300 "children, boys and girls, the greater part of them factory "half-timers, was that they made quite as much progress "as those who came regularly. Working in a factory "generally makes the children sharper than the others. "The half-timers who came at eight years old generally knew "nothing, but when they left at thirteen they could read, write, "and sum, and had a general knowledge of Scripture." The parents (Sheffield county district) are well able to pay 2d. to 4d. a week for schooling. Many earn 30s. or £2 a week. A boy of fifteen who is a good worker can earn towards 15s. a week, one of ten 5s. or 6s., and girls at file-cutting nearly as much. There is scarcely any work done by either parents or children on Monday, and by many none on Tuesday; by Saturday morning the week's work is finished. If the children worked regularly through the week they could do quite as much work, and attend school also like half-timers. As to the use of the fan to protect workmen grinding, Mr. Cook, a needle manufacturer at Hathersage, says—"We have 23 stones, and "are going to put up ten more. A 20 lb. packet of steel "wire loses 4 lbs. to 5 lbs. in grinding, and we grind about "100 packets per week, and there is 75 lbs. of steel-dust in a "day. We have put up fans and piping to protect the workers "from the dust—one tube six-horse power, and the two others "three-horse power each. To work this costs 10s. a day, but "they are indispensable to health, and every manufacturer "ought to be obliged to use them."

A heald is an open knitted framework made of cotton, and fitted to looms to raise the threads of the warp in process of weaving. It does not employ any considerable number of hands, but the evidence taken exhibits in a striking manner the hard work to which mere babies are put by their parents. Contrary to popular opinion, those children are worst off who work in villages, because there are no regular meal times, as is the habit in towns. Healds are also made by steam machinery in factories, but the evils alluded to arise in hand-looms. "In good times," (*i. e.*, before the cotton famine) says one witness, "I have had as many as seventeen girls knitting "healds and bottoming. *This little 'reacher' is six year old.* "Little fingers are best, they don't get in the way of the "bobbin. They haven't much time for schooling, of course. "This little one we taught her letters and to count. They "have to count aloud for the knitter to tell the numbers she "has coupled." Another witness says: "My granddaughter "began before she was six years old to reach for a heald "knitter. She used to work twelve and fourteen hours a day "for 1s. 3d. a week. She used to come home for breakfast, "dinner, and tea; always eat them as fast as she could, and "went back again. She is now eleven years old, and quite "crooked. One of her shoulders is up. That was done by "being so young at long hours." One witness, an employer, says: "I began at seven years old, and worked all night some-"times. That was at home for my father. It did me no "harm."

Boys and girls employed in tobacco manufactories seem very well paid; 4s. 6d. a week at eleven years old, and 12s. at sixteen years old are common wages. A Jew boy mentions that in Austria he was "obliged to go to school at six "years old." At a tobacco manufactory on a large scale in Edinburgh, where 70 boys are employed, rules are enforced for "opening windows at breakfast, dinner-hour, and night; for "seeing that boys have their hands and face washed, and hair "combed, before commencing work in the morning. Foot, "putting balls, and quoits are provided." There is an evening school in Edinburgh for tobacco boys. In the greater number of trades where children are employed, ten years of age seems to be the most common age for commencing work.

The artificial flower trade is well paid, but suffers from the bad habits of workpeople. They come late and stay late. Several of the most respectable employed would prefer early hours if they could enforce them. Most artificial flower girls begin to learn the trade at 10 years old and many at 18. As a rule they are without education, read badly if at all, and cannot write. The boot trade employs many boys since riveting susperseded the traditional awl and waxed thread of the cobbler. The sewing-machine has also much tended to collect the trade into factories. The result is to give more time for education—"they are not wanted so "early as stabbers." Hatters employ few boys, and these chiefly to fetch beer and wait on the journeymen. The great

house of Lincoln and Bennett is under trade union rules, and "limited to have only two apprentices for ten men and one "for every ten beyond." A great rise in the price of material has nearly abolished middle men. Calico costs double its former price, and shellac, which used to cost £2. 2s. a ton, is now £12.

In paper-mills, where a great number of children are employed, the education they get depends on the character of the employers. In one case, the father of a boy of 10, who had not been to school since he was 8½ years old, was receiving 39s. 6d. a week wages in the mill where the child earned 5s. a week. The child could read a little, but could not tell the names or number of the Apostles or Gospel. In another case, a boy of 13 who could only spell, letter by letter, the name of Jesus, and was utterly ignorant, was employed in a mill with his father, mother, and two brothers. The joint earnings of the family were 75s. a week!

The hardest work and the longest hours for boys are in the glass trade. Those employed in small establishments for making common flint glass in London being the worst off as to health and hours. The repeal of the Excise duties has enormously extended and modified this trade. One manufactory in the north, the largest in the kingdom in 1845, had increased its production in 1863 fourfold, or from 300,000 feet to 1,200,000. The manufacture of crown glass—that glass that has a knob in the middle—is dying out and being superseded by sheet glass introduced from the Continent. The glass bottle trade has also taken an enormous extension, as might be expected from the consumption of wine and bitter beer. In flint-glass works night-work for 6, 8, or 12 hours is almost universal in sheet-glass flattening kilns. The night-work is 12 hours. In glass-houses there are no stated meal-times: "Eat when "they can, and how they can." There is evidence of a great deal of brutality in the treatment of boys by the men they wait on in glass-works. The wages of this very laborious employment are good, but the expenses (in drink) heavy. In the lowest stages of glass-house work the lowest wages paid boys are about 5s. a week; in Glasgow, 7s., 8s., to 10s. a week; in Dublin, a boy of only eleven years old gets 6s. or 7s. as a taker-in by piece-work; in the north of England a boy of the same age, 9s. a week; in Yorkshire, a boy of ten years old, 8s. 6d. A glass bottle manufacturer in a good week paid as follows:—Finishers, £6 to £8 a week; blowers, £3. 10s.; gatherers, £2. 5s.; putters-up, £1. 5s.; takers-in, 15s. Boys get a trifling part of their earnings. Sometimes 6d. a week is put by for clothes; but there is a sad story of a boy who earned 10s. to 11s. a week, and out of 6d. a week allowed him had saved 17s. "But when my little sister died they buried "her with it. Father and mother told me to draw it, and the "bank man asked me, 'Was I going to draw it?' and I told "him it was to bury my little sister. I have not put any "money by since." This boy had no clothes for church-going, and no trousers but his working pair; yet his father was regularly employed in the same work. To repeat, the question to be considered, after all this evidence, is how far the Factory Acts can be usefully extended to other employments than textile manufactories. But this cannot be answered and settled off-hand.

THE LEAMINGTON LOCAL BOARD AND THE GAS COMPANY.

Again we feel called on to notice the proceedings of the Leamington Local Board in their attempts to coerce the Gas Company to use the "double tap," for to that issue the dispute appears to have arrived. The more they move in the matter, the deeper they sink into the mire; and the only means of extricating themselves seems to be to pay Mr. Hughes his fee, retrace their steps, and to admit that they have been wofully misled.

Before noticing what has been further done, it may be desirable to recapitulate the course of conduct that has brought the Local Board into such a dilemma. In the Act of the Leamington Gas Company, passed last session, special provisions were introduced, at the instance of the Local Board, with the assent of the company, regulating the conditions on which the town was to be lighted. Those conditions comprised the adoption of average meter indication, a lower charge for gas supplied to the public lamps than to private consumers, and, for the purpose of securing uniformity between the metered and the unmetered lamps, it was provided that "a "self-acting pressure regulator, or other proper regulating "apparatus" and burners should be affixed to every lamp by the gas company, to the satisfaction of the lighting authority, and in case any differences should arise, the question was to be referred to the chairman of the Quarter Sessions. The Local Board thought fit, under the guidance of their clerk, to apply to Mr. Samuel Hughes to assist them to carry the provisions of the Act for public lighting into operation, and that gentleman proposed several arrangements that could not fail to be objectionable to the gas company, including the disuse of the existing lamp-columns, which belong to the company, the purchase of new ones by the Board, the discontinuance of pressure regulators, and the adoption of Mr. Hughes's "double tap" as "a proper regulating apparatus." The directors refused to negotiate personally with Mr. Hughes, who had made decidedly hostile demonstrations against them, and a lengthy correspondence consequently ensued, in the course of which the company positively refused to admit the double tap as a regulator, and requested that the question should be referred to the Quarter Sessions. They also resisted some other demands, urged at the instigation of Mr. Hughes, which appeared to be unjust and opposed to the provisions of their Act. The Board endeavoured to tempt the company to adopt the double tap, by offering, on that condition, to purchase their lamp-columns; but the directors were not to be tempted, and remained stanch to their refusal. The Board then advertised for tenders for new columns, according to a pattern proposed by Mr. Hughes. In the meantime the contract for lighting the streets expired, and notice was given to the company to continue to supply gas to the public lamps for three months longer, at the reduced quantity of 4 feet per lamp instead of 5; the company being also informed that in any subsequent arrangement for the purchase of the lamp-columns, the Board should insist on the double tap as a *sine quâ non*. That was the state of affairs at the meeting of the Board on the 3rd inst., when the following communications from the gas company were read:—

Gas-Works, Leamington, Oct. 2, 1865.

Dear Sir,—I beg to acknowledge the receipt of your letter of the 29th ult., and of the notice which accompanied it. We will do our best to comply with the same with the least possible delay, but as the reduction in the hourly consumption of gas, from 5 feet to 4 feet, requires a change of burners, some days must elapse before it can be made. In the meantime we shall continue to use the present 5-feet burners. The company require a contract to be entered into under the seal of the board, and that a rent of 9d. per column be paid for the use of their columns for the three months, in addition to the allowance of 3s. 3d. for lighting, extinguishing, and cleaning, and for the use and maintenance of the service-pipes, cocks, burners, and other fittings.—I am, &c.,

JOHN MAUGHAN,
Chairman to the Board of Directors.

To R. A. Wallington, Esq., Clerk to the Leamington Local Board of Health.

Gas-Works, Leamington, Oct. 2, 1865.

We hereby offer, on the part of the Leamington Priors Gas Company, to sell you all the cast-iron lamp columns and brackets belonging to them, and now fixed within the district of the local board, at £1 per bracket and column respectively, and to accept payment for the same in two equal yearly instalments—the first being due and payable on the 1st of January, 1867; and in the event of this offer being accepted by you within seven days from this date, we undertake to alter the lamps not attached to our columns, so as to allow of the same being lighted and extinguished by a lanthorn fixed at the end of a rod, without requiring a ladder to be used, such alteration being made at the joint expense of the board and the company. We have 506 columns and 34 brackets, or thereabout, in use in Leamington.

JOHN MAUGHAN, Chairman of the Board of Directors;
EDWARD BERRIDGE, } Directors.
R. POWELL. }

To Messrs. the Local Board of Health.

P S.—The foregoing offer is ma le without] prejudice to the question respecting the use of the double tap.

At a meeting of the board of directors of the Leamington Gas Company, held at the company's works, in the town of Leamington, on the 2nd of Oct., 1865, it was resolved—"That, in the event of the Leamington Local Board of Health declining to purchase the columns and brackets of the company, and deciding to provide any new columns for the public lamps over and above the number the Board of Health may require for the purpose of affixing a meter to one in every twelve lamps supplied by the company with gas, the gas company do require of the local board that all such new or additional columns shall be provided with doors in the bases, and each made capable of conveniently receiving a 2 light meter, the company hereby undertaking, in accordance with the 50th section of the Leamington Priors Gas Company's Act, 1865, and with the true intent and meaning thereof, to pay to the local board the difference in the expense which the local board may thereby incur."

Resolved—"That the gas company do forthwith direct the attention of the Leamington Local Board of Health to the fact that, as required by the 47th section of the said Act, the company have provided, and are now provided with, service-pipes, lamps, burners, stop-cocks, and other apparatus connected therewith, necessary for the proper lighting of the highways, streets, and other places under the contro of the Board of Health or lighting authority, and that the company will not recognize the reasonableness nor the right of the Board of Health capriciously to provide and erect columns not adapted to such lanterns, service-pipes, stand-pipes, and stop-cocks."

Resolved—"That the secretaries of the company do forthwith make and

deliver to the clerk of the Leamington Local Board of Health, under the seal of the company, a copy of the foregoing resolutions."

The very liberal offer of the gas company to sell their lamp-columns for 8s. each less than the lowest tender, exclusive of 2s. 6d. for lamp-heads, showed most clearly their disposition to come to terms with the Board, if the latter would only meet them in a fair and reasonable manner. Even the chairman seemed to be struck with the liberality of the proposal, which he pronounced to be "a very reasonable offer;" but the clerk of the Board, whose hostility to the gas company is most remarkable, whispered in his ear, "Refer it to Mr. Hughes." A resolution was moved by Mr. Gascoyne, to the effect that the offer of the gas company should be accepted, which he said would save the town at least £800, but the consideration of it was deferred to an adjourned meeting, to be held on the 6th inst. Before that meeting took place, the last number of our JOURNAL, containing diagrams of the sizes of the flames of the Reading lamps at different periods of the night, had been received, and the illustration appears to have had a most telling effect on the minds of some of the members of the Board. Mr. Gascoyne, indeed, asserted that it was an exaggeration of the difference; but the diagram was taken from actual measurement, and there can be no doubt that it correctly represented the different sizes of the flames in many parts of Reading. In those parts of the town more distant from the gas-works, where the differences of pressure of the gas in the course of the evening are not so great, the disparity may not be so striking. It was asserted by him that as the maximum pressure of the gas in the mains at Reading is 23/10ths, while at Leamington it amounts to 30/10ths, the greater pressure of gas in the latter town would produce greater equality in the size of the flame when the pressure at the works was reduced. We do not understand by what proces of calculation Mr. Gascoyne arrived at that conclusion. If the extreme pressure were greater in the early part of the night, the difference in the size of the flames would also be greater than at Reading at the time of minimum pressure, instead of being less. A curious misapprehension appears to have been entertained at the meeting respecting the effect of the purchase of the present lamp-columns in limiting the power of the Board to use the double tap. The clerk—who had on a previous occasion expressed the extraordinary opinion that if new columns were purchased the Board might use the double tap despite of the company or the Quarter Sessions—said that the purchase of the old lamp-columns without making the double tap a *sine qud non*, would materially prejudice their position, and that in his opinion the decision of the Quarter Sessions would be against them. Mr. Hughes also expressed the same opinion, and he is reported to have said that "perhaps at "the Quarter Sessions the chairman might refer it to some "other person possessing an intimate knowledge of gas "engineering. Then it would be almost impossible to steer "clear of interested persons and get out of the interests of "the gas company, who might unthinkingly decide in favour "of the present regulators. There was great difficulty in "getting such regulators to act properly unless they were "taken off every week." The clerk of the Board and Mr. Hughes are evidently desirous of avoiding an appeal either to a court of justice or to any person competent to decide the question, and their wish is to bind the company to the use of the double tap as a condition of the purchase of their lamp-posts, so that they may have no escape should the matters in dispute be brought before the tribunal appointed by Parliament. With respect to the assertion that pressure regulators will not act properly unless taken off once every week, Mr. Hughes must surely have been aware that it is contrary to fact, for it is well known that Mr. Sugg contracts with the Imperial Gas Company to keep all the regulators in repair for the small sum of 3d. each per annum. Mr. Hughes omitted to state also that his pet double taps at Reading are readjusted monthly by an inspector appointed by the gas company, and by another inspector appointed by the Local Board. The former, we believe, receives £20 per annum for performing that duty, and we presume the salary of the latter is at least equal to it; and, as there are about 400 lamps in Reading, the expense of adjusting the double taps must be nearly 2s. each, or eight times the sum for which pressure regulators might be maintained in efficient working condition. The carrying out of Mr. Hughes's recommendation would probably cost the Board more than it would to purchase the company's posts, and fix a meter to every lamp, in which case the objection of the gas company to the double tap would cease, should the Board then desire to check the flow of gas to the burners. There is no practical difficulty in applying meters to the old lamp-columns, and the purchase of them by the Board would save the ratepayers, it is estimated in one of the local papers, £1000. The total number of columns and bracket-lamps in Leamington is about 540, and, as the Board are bound to fix a meter to one lamp in twelve, 45 meters must, under any circumstances, be provided by them. It therefore becomes a question for their consideration, whether they should not also provide the additional 495 with the money saved by the purchase of the old lamp-columns, and thus settle the great tap question to the satisfaction of all parties.

At the adjourned meeting, the committee to whom the offer of the gas company had been referred recommended "that the "Board write to the gas company, offering to purchase the gas-"columns and lamp-heads, also the brackets, at £1 for each "column and lamp-head, and £1 for each bracket and lamp-"head, subject to the Board supplying one metered lamp to "every twelve lamps; and that the gas company waive their "right to any other metered lamps. The question of the "double tap to be conceded by the company, or referred to the "decision of the chairman of the Quarter Sessions." The discussion turned principally on the proposed reference to the decision of the chairman of the Quarter Sessions, for it was assumed that it would be against the double tap. The majority of the Board, in the proportion of six to four, were in favour of striking out the words, and the report was then agreed to.

The local press are unanimous in their condemnation of the course taken by the Local Board, and several of them have transferred to their columns our remarks on the subject and the letter of Mr. Richards in our last, explaining the reasons which induced him not to notice the double tap when revising the second edition of Mr. Hughes's "Treatise on "Gas-Works." Mr. Richards stated that he "attaches no "importance to the instrument;" that, "under some condi-"tions, it is worse than useless;" that he is "at a loss to "understand how the double tap has been termed a regulating "apparatus;" that "it does not merit the name;" and, finally, that "it answers no useful purpose." These opinions are sufficiently strong, coming as they do from the editor of Mr. Hughes's book; but there is evidence against the effects produced by the double tap still stronger than than of Mr. Richards, and *it is the evidence of Mr. Hughes himself*. In 1861, a series of papers written by him appeared in the *Artizan*, which he reprinted in a separate form in June, 1862, as a "Treatise on Public Lighting," with a preface not very complimentary to ourselves. The subject is considered under the various heads of application of gas to public lighting—arrangements under which public lighting is conducted—prices paid for public lighting—expenses of lighting and extinguishing—the kind of meter recommended—on the consumption of gas as affected by pressure—recent improvements in public lighting by the use of regulators—general remarks on regulators and contrivances for lighting and extinguishing without ladders. In that portion of the treatise devoted to "Recent Improvements in "Public Lighting by the use of Regulators," &c., there is no mention of the double tap as a regulating apparatus, but there occur the following remarks strongly condemning all attempts to regulate the consumption of gas by the adjustment of taps near the burner:—"*The great mistake* by private consumers is "that of attempting to regulate the gas at each individual "burner by partly closing the tap, so as to check the passage "of the gas, to reduce the pressure, and form a flame of the "required size. *Now gas never burns properly under these cir-"cumstances.* The current of gas being impeded by the partial "closing of the tap, is deflected against the side of the pipe, "and issues in an irregular manner; the consequence is a "jagged, imperfect flame, *which gives much less than the proper "quantity of light.* The best method is to have all the taps of "the individual burners turned full on, *so as to interpose no "obstacle to the passage of gas near the point of combustion,* "and to effect the regulation at the meter. The gas has then "time to recover itself before coming to the burners, and the "flames are always regular and uniform in outline." Then follow descriptions, with wood-cuts, of the three street-lamp regulators at that time in use, one of them being the same as those now fixed to the lamps at Leamington. From the "General Remarks on Regulators" we make the following extracts:—"The use of these instruments has given rise to

"some difference of opinion as to whether they are advan-
"tageous or otherwise for the public lighting. In the first
"place they produce an almost perfect uniformity of flame,
"*which is a great improvement on the old system*, under which
"the flame, in some cases, varied during the night from 5 feet
"an hour down to 1½ and 2 feet. 2nd. The gas burns with a
"more uniform and steady light, in consequence of the cock
"being fully open, and the passage for the gas being an
"annular one, formed of smooth and accurately turned sur-
"faces. There is a considerable increase of illuminating power
"from this cause alone, even when the same quantity of gas is
"burnt."

* * * * * *

"When local authorities burn by meter, as they invariably
"should do, *I recommend the use of the regulator in all cases*,
"as it will contribute greatly to the saving of gas, *will give a*
"*better light with the same quantity*, and prevent irregularity
"arising from the judgment of the lamplighter, however skil-
"fully this judgment may be exercised."

We will not weaken the force of Mr. Hughes's objections to the use of a tap which checks the free passage of gas near the burner, nor his commendation of pressure regulators, by any comments of our own, but shall content ourselves with recommending them to the consideration of Mr. Muddeman, who expects that the double tap will greatly increase the illuminating power of the gas, and to the other members of the Leamington Local Board of Health, who were inclined to squander the public money to obtain it.

A correspondent has drawn our attention to the fact, that the design for the lamp-column which Mr. Hughes recommended the Board to adopt is copied without variation from the pattern-sheet of a dealer in such articles in Lower Thames Street, whose tender was the lowest of the twelve sent in reply to the advertisement. The large lithograph sheet of the elevation of the column, and the six folio pages of lithography containing the specification of Mr. Hughes's column, appear therefore to have been an unnecessary expenditure, which a few words added to the Board's advertisements for tenders would have avoided. It would be well, however, for the ratepayers if this were the only unnecessary expenditure by the Local Board in their attempts to coerce the gas company to adopt the recent crotchets of Mr. Hughes.

We believe the gas company have declined the offer to purchase their lamp-columns on the terms named in the resolution of the Board, by which they were required to forego their right to have a meter fixed to every lamp, and to adopt the double tap as a regulating apparatus. It now remains to be seen what will be the next move. To purchase and fix new columns will involve an outlay of from £1500 to £2000, by a body at present unable to pay their contractors for work done, and for which payment is due. According to the statement of the clerk, the Local Board have "neither money nor credit at "the bank;" and, under the circumstances, to rush headlong into expenses for an object that is worse than useless would be a reckless squandering of the ratepayers money, which they must be the models of patience and forbearance to endure.

Circular to Gas Companies.

THE contentions and bickerings caused by partial meter indication have only one satisfactory termination, and that is, the fixing of a meter to every lamp. That solution of the differences which have for some time past existed between the lighting authorities and the gas company in the little town of Kettering, in Northamptonshire, has been recently determined on. There are, we understand, only 68 public lamps in the place, which have been lighted and extinguished by the local authorities, and it has been the constant practice to light the metered lamps last and extinguish them first. The gas company, after enduring this for some years, at length refused to continue the supply unless a meter was provided for each lamp. For that fraudulent practice there is, indeed, no other effectual remedy; and we have reason to believe that it is in contemplation to adopt it in several other places, for the protection of gas companies against that abuse of the system of partial meter indication by which they are defrauded. In many instances the money expended in the disputes between local boards and gas companies would go far towards paying for all the meters, and by that means a far more satisfactory settlement of differences would be obtained than can ever be done by employing gas engineers from London, or appealing to courts of law.

It is currently rumoured, and we believe correctly, that the Corporation of the City of London—or, more properly speaking, that anomalous body designated the Commissioners of Sewers—have determined to promote a Bill in the approaching session of Parliament, to empower them to supply the City with gas, in competition with the three existing companies. It may be interesting, therefore, under such circumstances, to trace the effect of a similar competition in the city of Limerick, as developed in a very full and able report recently made by Mr. Macnie, the engineer and manager of the special Gas Committee of the Limerick Corporation. Mr. Macnie gives an account of the whole course of the undertaking, from the time it was transferred to the Corporation to the end of June last, when he commenced the management of the works; and though he endeavours with much skill to make the best of the matter, his report discloses a deplorable course of progression from bad to worse. The Corporation became possessed of the works in April, 1856, having purchased them from a consumers company that failed to receive sufficient support from the public to continue their operations in competition with the United General Gas Company, who had for some time supplied the city with gas. The sum paid by the Corporation for the works was £10,000, which in the first balance-sheet is stated to be the value of the works and plant. The price of gas was then 5s. 6d. per 1000 feet. The first year's gas-rental for private lights amounted to £2315, and the public lights were charged £1400, making a total rental of £3705. The sum paid for coals, at the price of 20s. 10d. per ton, was £2012, and the quantity of gas brought to charge per ton of coal carbonized was estimated at 7100 feet. It evidently could not be a prosperous state of affairs when the cost of coals was nearly equal to the private gas-rental, and the yield of gas per ton not more than 7100 feet; nevertheless, the accounts show a profit of £457 on the year, after allowing 5 per cent. interest on the capital. On the other side of the account, however, there appears the sum of £1167 as "sundry advances from "Corporation," for the expenses of mains, gasholders, and meters. This result of the first year's operations was not encouraging, but all those that followed were worse. It is true the accounts show that during the first three years after the works became Corporation property there was realized a profit of £1004, but the money advanced by the Corporation greatly exceeded the stated profits, for it amounted to £3800. The report then states: "In the two following "years there appears to have been a loss in the working, to "the amount of £716. 15s. 11d. The next year—1861—"was a profitable one, showing a surplus of £286. 6s. 2d.; "but after this year there has been an ever-increasing loss, "until the close of the half year ending at 30th June last "(1864), when the loss for the six months reached the sum "of £787. 15s. 2d. The actual deficit in the whole period "over which this report extends, after absorbing the gains of "the profitable years, amounts to £1077. 1s. 3d." Mr. Macnie contends that this deficit is not a loss, because interest has been yearly charged in the accounts on the capital; and he claims—as an advantage gained by gas consumers and the citizens by the Corporation management of the gas-works—the reductions made in the price, by which he estimates the private consumers have saved £1900, and that there has been saved in the public lighting £1900. Against these claims, however, it must be stated that the reduction in price from 5s. 6d. to 5s. per 1000 feet was first made by the United General Gas Company in 1857. It may be observed also that the citizens of Limerick do not show, by their demand for Corporation gas, that they appreciate the efforts made by that body on their behalf, for the private gas-rental has only advanced from £2315 to £3124 in the course of six years, and the Corporation thought fit not long since to make a remonstrative appeal to the citizens for increased support. The sums received from the Corporation to keep the concern afloat, amounted in June, 1864, to £6028; but in the last balance-sheet of the accounts nearly the whole of that sum appears among the assets, as additions to works and plant. It would be almost as rational a system of book-keeping to set down the amount paid for wages since the Corporation undertook the supply of gas as part of the assets; for the money advanced has been expended in attempting to keep the works in a state of efficiency equal to that in which they were when transferred to the Corporation. If the actual present value of the works and plant be not greater than when purchased, then

the £6000 advanced by the Corporation has been lost; and of their depreciated condition the report affords ample evidence. Mr. Macnie reports that in the month of June, 1864, "there "were at work more than two-thirds of all the retorts on the "premises, a state of matters positively frightful, and which I "confess filled me with dismay, as it was quite clear that when "the whole of the retorts should be at work, gas in sufficient "quantities to meet the consumption of the shorter days could "not possibly be produced." The dilapidated state of the retorts and mains is further shown by the decrease in the quantity of gas brought to charge per ton of coal carbonized. In the first year, as we have said, it was only 7100 feet; it fell in the third year to 6300 feet; and in 1863 the quantity did not exceed 5500 feet. Mr. Macnie states that to put the works in efficient state to meet the present demand for gas would require at least £500, without taking into consideration the mains and service-pipes, and those, he admits, were very much corroded. The depreciation-fund was entirely exhausted, and the Corporation, when the last accounts were published, found that after having expended at least £7000 on the works, in addition to the original purchase, they were in possession of a concern which was carried on at a loss of £789 in the half year. This lamentable condition of the Limerick Corporation Gas-Works should be a sufficient warning to other corporate bodies against embarking in such speculations in competition with an existing company. It is most probable, indeed, that Parliament will protect the citizens of London from being dragged into a similar vortex by the Commissioners of Sewers. There is no precedent of the grant of parliamentary powers to enable a municipality to compete with private enterprise in the supply of gas, and it is not likely that such a precedent will be created in the City of London, which is already supplied with gas by three companies.

At the recent meeting of the Association of Gas Managers at Edinburgh, a paper was read by Mr. Reid, manager of the Edinburgh and Leith Gas-Works, describing a new kind of rotary exhauster, invented by Mr. R. W. Thomson, which is extremely ingenious in its mechanical arrangements, and promises to be very efficient. Inside the cylinder which forms the working part of the machine, are "piston-wings," which rotate on the same centre, and fit close to the inner surface, so as to enclose spaces nearly air-tight. There are slits in the cylinder for the inlet and outlet ports, and by the revolution of the piston-wings, the gas as it enters is carried forward, and is discharged at the outlet in a continuous current. The most ingenious part of the apparatus consists in the manner by which differential velocities are given to the piston-wings, and their transposition into each other, which is effected by means of elliptical gearing. The movements of the wings are so arranged, that at the moment the gas enters the inlet orifice they are placed at an angle of 45°, but as they continue to rotate, one wing moves three times as fast as the other, and enlarges the space enclosed between them till it amounts to three-fourths of the whole capacity of the cylinder, when the outlet is opened. The two piston-wings, though continuing to rotate in the same direction, have then their relative speeds reversed; the one that before moved the faster becomes the slow-moving wing. In this manner, by one complete revolution of each wing, the quantity of gas that is discharged is equal to twice three-fourths of the capacity of the cylinder, or one and a half of the whole. With four piston-wings so arranged, one complete revolution discharges a quantity of gas equal to three times the capacity of the cylinder. Mr. Reid stated he had found that the work done by this kind of exhauster, when put in operation at the Edinburgh and Leith Gas-Works, under a pressure of 18 inches of water, was equal to 87½ per cent. of the actual duty; and the highest duty of the exhausters of the best makers, in ordinary use, was 70 per cent., there being 17 per cent. in favour of the new machine. The ingenuity of the invention is more remarkable when it is employed as a rotary steam-engine, for in that case the slowly-moving piston-wing forms the abutment against which the force of the steam reacts; the moving power being obtained by the mechanism which causes the acting piston to rotate faster than the one that serves for the abutment—both moving in the same direction, with different velocities, and each one becoming in turns the agent and the reagent.

We inserted in our last an abstract of the specification of Mr. Keeling's patent for an improvement in the mode of regulating the pressure of gas governors by means of water instead of by solid weights, to which we desire to direct attention. The apparatus is very simple. It consists merely of two vessels, partly filled with water, and connected together by a flexible tube, so that when one is raised above the other the water may flow from the higher into the lower. One of the vessels acts as the counterpoise of the gasholder-governor, and when it is required to alter the pressure of the gas, the other vessel is raised or lowered, and the counterpoise is thereby gradually increased or diminished by the flow of water through the flexible tube. The great advantage of this contrivance is, that the pressure is changed almost insensibly, instead of by starts, as is generally the case when weights are employed for the purpose. We believe Mr. Keeling's apparatus has been successfully applied to a 36-inch governor at the Battersea works of the London Gas Company.

Correspondence.

MR. QUICK'S REPORT ON CONSTANT WATER SUPPLY *VERSUS* INTERMITTENT SUPPLY.

SIR,—I have been perusing Mr. Quick's report rather carefully and shall be glad if you will insert the following letter, as I think the conclusions he arrives at are almost absolutely the opposite of those entertained by the engineers and managers of constant-supply works.

My information is gleaned from a personal knowledge of several works, one of which is Wolverhampton, at which town a constant supply is distributed at an average pressure of about 120 feet, and a consumption of water of something less than 15 gallons per head per day. I am told that Sunderland, Salford, Lincoln, Leeds, and Warrington are in about the same position; so that instead of a constant supply being, as Mr. Quick says, inconvenient and wasteful, it is in the towns named, as well as Nottingham, Derby, and other places, being carried out for half the quantity of water per head per day which Mr. Quick admits his intermittent system entails on the company he represents.

Some returns I have inform me that—

Ashton	Gloucester	Rochdale
Aberdare	Greenock	Swansea
Blackburn	Halifax	Southampton
Bolton	Huddersfield	Sunderland
Birmingham	Ipswich	Shields
Bristol	Kilmarnock	Stockport
Bury	Lancaster	Salford
Bradford	Macclesfield	Taunton
Coventry	Manchester	Wakefield
Cork	Newcastle-on-Tyne	Warrington
Dundee	Nottingham	Wolverhampton
Dukinfield	Northampton	Wellington
Derby	Preston	Worcester
Glasgow	Reading	Yarmouth, Great

have constant supplies, and most of the companies are managing their works much below the 30 gallons per head per day Mr. Quick consumes in the Southwark and Vauxhall Company's district.

These particulars, and the fact that new constant-supply companies start each year, disprove Mr. Quick's statement that the result of the whole evidence is against the constant-supply system; and, if further disproof is necessary, we need only turn to Plymouth, Devonport, Chester, Shrewsbury, Oxford, and Exeter, at which places the intermittent system is adopted, and results in a consumption per head per day equal to, and exceeding, the 30 gallons mentioned by Mr. Quick.

Taken generally, the evidence of England, Ireland, and Scotland is strongly in favour of the constant supply, as regards its economy to a company, or the parties supplying the water, and it is only in a comprehensive sense this question ought to be viewed, as exceptional cases can, and will, always be produced, such as Mr. Quick's reference to the Kent Water Company's experiment, which cannot stand against the number of large towns cited. It is easy to conceive several reasons why in this special case good results were not secured, and I have no doubt that if the same houses were submitted to the charge of a constant-supply engineer or manager, they would not consume more than similar houses do at a well-managed constant supply works.

Considering the question as affecting the public or consumers, the fact of the constant supply giving an unlimited quantity at all times, fresh from the mains, whether the fittings are in repair or not, is conclusive as to its quantitive superiority over the limited volume supplied during a few hours a day to a cistern (there is not always one provided) by the intermittent system; and if it is borne in mind that in the constant supply the water is not subject to the deteriorating influences of deposits, or exposure in cisterns, which always affect the temperature, and generally the purity, of the water, it is manifest that the constant supply has by far the advantage over the intermittent system in a qualiative point of view.

In touching upon the cost of the change from the intermittent to the constant supply, the items enumerated by Mr. Quick would not in most cases be required, as with a constant supply, cisterns are not used, and if they were enforced those now in use for the intermittent system would, at the least, be large enough for the regular pressure. So much for No. 1 regulation, and No. 2 is

equally superfluous, for if one pipe from the main to the cistern now supplies a number of houses on the intermittent system, what is to prevent a similar arrangement answering for the constant supply, and why impose this useless expense of separate branches from the main for each house? The latter part of this regulation, by which draw-off taps are not allowed on the pressure or inlet pipe, is directly contrary to the practice of the kingdom generally, and loses several of the advantages of a constant supply.

The third regulation is a very desirable one, as also is the fourth, which refers to strength of pipes and stop-cock; but as the variations in level mentioned in a subsequent part of Mr. Quick's report show a pressure of 160 odd feet in some parts of the district, the fair inference is that the present pipes are quite strong enough to resist the constant pressure, and if they are not, most companies pay the cost of the service-pipes up to the private property.

The fifth regulation is necessary, and I should say is now in operation as far as misuse is concerned, and for waste, is in other places not found to be irksome to the public or expensive to the company, as the latter would save in turncocks expenses more than they incurred by inspectors.

As to fires, &c.—It is well known that a constant supply admits of stand-pipes being fixed direct to fire-cocks on both the main and branch mains, giving a great advantage over the intermittent supply, which requires cocks to be opened before water is obtained. Mr. Quick's supposition in this case is a complete error, as the present London pipes, being of sufficient capacity to supply the water required in a few hours each day, they would be ample (and of course could be made so under any circumstances) in capacity for all the requirements of an absolutely efficient constant supply.

I think it very probable that the constant supply could be adopted in London for a consumption of much less than 30 gallons per head per day, and thus benefit both the companies and the consumers without increasing rates or making the necessary supervision unpleasant.

I have trespassed on your space more than I intended, but as this question admits of great consideration, I hope some of your qualified readers will take the matter up, and have a thorough discussion of it in all its bearings.

HENRY TOMLISON.

Water-Works Office, Cambridge, Sept. 28, 1865.

SIR,—My attention has been drawn to "Mr. Quick's Report to the Southwark and Vauxhall Water Company on Constant Water Supply," and to your remarks thereon, in pages 683 and 692-3 of your really valuable JOURNAL, dated September 19, 1865, and numbered 337.

In this letter I shall, to save your time and space, merely refer to the fourth paragraph in Mr. Quick's report.

He says: "In the towns of Bristol, Croydon, Dover, Wolverhampton, Preston, Woolwich, Rugby, and others, where the works have been laid out with every provision to meet the requirements of constant supply, it is found that either from wilful or accidental waste, the system has proved more or less completely a failure, after entailing upon the ratepayers an enormous expenditure."

From 1842 to 1854—nearly thirteen years—I was the manager of the Preston Water-Works.

At the request of Dr. Lyon Playfair and the Rev. John Clay, Chaplain of the Preston House of Correction, I so arranged the supply of water from these works that at any time the actual consumption or demand, including waste, could be ascertained.

The contents of each of the company's reservoirs, which could be used as a service reservoir, were calculated, inch by inch, and a system of valves introduced by which any one or all of these reservoirs could be used.

During the ten years ending in September, 1854, the daily consumption of water in Preston never, except on two occasions, reached 1 million gallons; and *never*, during that period, did the "domestic" demand for water exceed 60 gallons per house of, on the average, 5½ persons.

If ever there was a "constant" supply of water to a large town, it existed in Preston from 1842 to 1854, during the whole of which period the water was never "shut off" with a view of checking either a legitimate demand or waste.

In 1841, the population of Preston was 50,073. In 1851 it was 68,356. In 1861 it was 82,888. In 1842, the water company supplied rather less than one-half of the population. In 1854, it supplied rather more than three-fourths of the population.

You, sir, and your readers, may from this short statement form some idea of my experiments and their value in reference to the water-wants of a town population, which wants in this case, as has already been stated, never exceeded 60 gallons a day per house of 5½ persons, during the ten years immediately preceding 1854, and when no stint or limit whatever was a condition in the terms upon which a constant supply was given.

In this letter I dare not so far trespass upon your space as to reply in detail to the "Quick-witted" report which induced me thus to trouble you. That that report is founded on exploded and old-fashioned ideas and theories, I am certain; for, after years of quiet meditation and a gathering together of carefully procured and prepared statistics, I am enabled to prove as clearly as anything can be proved in this world, that the "intermittent" system of water supply, as compared with the "constant" system, has not a sound argumentative leg to stand upon.

Every human "system" may—is liable to—fail; but that the system of water supply, as in force and practice in Preston from 1842 to 1854, was a "complete failure," *because* the supply was "constant," is positively untrue. To this fourth paragraph in Mr. Quick's report I can give a flat contradiction, and am prepared to prove what I now assert.

ROBERT ANDERTON,
Secretary to the Fylde Water-Works Company.

Fylde Water-Works, Kirkham, Oct. 1, 1865.

WATER SUPPLY AND MR. QUICK.

SIR,—After perusing the report of Mr. Quick to the Southwark and Vauxhall Water Company, on the subject of "Constant *versus* Intermittent Water Supply," one might almost imagine it was not in earnest, but meant as an attempt to elicit from engineers and water-works managers their several opinions as to the best mode of governing the indispensable system of "constant supply."

Mr. Quick says "the result of the whole evidence coming from different localities, and arising under a great variety of circumstances and conditions, is conclusive against the system," and that "wherever the experiment has been tried it has entailed the greatest inconvenience on both the companies supplying and on the consumers of water." Now this I question, for what will Mr. Quick say about the fact, that in Leeds, Bradford, Manchester, Oldham, Halifax, St. Helen's, Southport, Bury, Derby, Nottingham, Sheffield, Durham, Newcastle, Sunderland and South Shields, Glasgow, Edinburgh, Stockport, Blackburn, Burnley, Birkenhead, Dewsbury, Heckmondwike, Cork, Queenstown, Accrington, Belfast, Shrewsbury, Macclesfield, Wigan, Warrington, Darlington, Stockton and Middlesboro', Cheltenham, Leamington, Cambridge, Bolton, Huddersfield, Hull, Leicester, Carlisle, Whitehaven, Darwen, Chorley, Kendal, Dumfries, Stirling, Gloucester, Rathmines (and many more places I cannot at this moment call to mind), the system of "constant supply" has for years been satisfactorily maintained, and has proved not only beneficial to the general health of these towns, and a great boon to the inhabitants, but remunerative to the proprietors.

Mr. Quick gives as his reason:—"That no precautions have been found sufficiently practicable to guard against waste so as to enable the supply to be continuously sustained at high pressure." Now really this is a surprising statement from a man of such eminence, and I am sorry to have to deny it in *toto*. The precautions necessary are simple and inexpensive—pipes of proper strength, taps of good quality, and none allowed over stench-traps; good workmanship, double-valve water-closet cisterns (to let down a regulated quantity of water for each flush, and thus prevent the waste consequent upon the use of the old-fashioned single-valve cistern), and annual or even biennial inspections. These are the only necessary precautions, which, when properly attended to, the system cannot possibly fail.

Mr. Quick states that in Boston the average consumption is 55 gallons per head per diem; this of course is three times more than a legitimate quantity, but such monstrous waste is no evidence in favour of "intermittent supply." Mr. Quick cannot be ignorant of the fact that at Plymouth, where the water is only turned on *two hours every other day*, the consumption is no less than 50 gallons per head. Is not this a proof that quite as much water can be wasted by one system as the other. Further, I contend it must and always will be so, for this reason: when the consumer is aware the water is always to hand by a turn of the tap, he merely uses sufficient for his requirements; but let it once be known the supply will be turned off for some time, every available vessel is filled to serve for his possible want during the period of abeyance, and of course when the supply is again resumed, the vessels are emptied (the water consequently wasted) to enable them to be refilled from the fresh supply. This is the case to a far greater extent than Mr. Quick for one moment imagines, or he would never recommend the adoption of "intermittent supply."

Next, as to Mr. Quick's proposed remedy for this imaginary evil. He recommends the erection of large cisterns for each house at a cost of £5 to £10 each, which is simply absurd and impracticable, for it would, where done at the expense af the company, in many instances double the capital, and where at the expense of the consumer, who is perhaps paying 2s. or 2s. 6d. per quarter, nearly double his charge, for we must calculate interest on his outlay.

But Mr. Quick very generously ventures further in the way of charges, although at the same time he modestly adds it is not within his province to offer any suggestions on the financial part of the subject. He says the company would be compelled to increase the rates to the full extent of their parliamentary powers, involving an advance of from 5 to 20 per cent. (this is independent of interest on consumers' capital invested in cisterns). Is that likely to meet with the approval of the public at large, or even of individuals? An unnecessary advance of water-rates in this age of economical supply (except in extreme cases, such as Sheffield, where, to meet the interest on the additional capital required to pay the damages caused by their sad calamity, Parliament granted an increase of 25 per cent. on their charges), is opposed to all experience, and against all reason as a workable or even plausible scheme.

In conclusion, I assert that should such an impossibility ever happen as that the "constant supply" system should be universally condemned and abandoned, to say nothing of the serious inconvenience to the domestic consumer, it must and would eventually damn the commercial prosperity of the world.

THOMAS HALL,
Secretary to the Stockton and Middlesboro' Water-Works Company.

Darlington, Oct., 1865.

Register of New Patents.

11.—MARTIN BENSON, of 14, Hinde Street, Manchester Square, in the co. of Middlesex, engineer, for "*An improvement in ordinary lift and force pumps.*" Patent dated Jan. 3, 1865.

This improvement consists in so constructing the pump that the cylinder or barrel of it can be turned and secured to any joint within the range of its motion, for bringing the discharge-spout to any desired position, so that it can be moved round the circumference of the cylinder, secured, and worked from any point to suit the position of the pump. By thus making the two parts moveable, as described, the pumps can be placed in the least possible cramped space, and any position, without having to be specially constructed for the purpose.

The lower and upper end of the cylinder of the pump is made without flanges, in place of which they are furnished with dovetail-shaped forms. A recess flange or plate is used for attaching to the lower end of the cylinder for the double purpose of serving as a valve-seat for the inlet-valve, and securing the pump in its place for working. The end of the cylinder is placed into the recessed flanges, and by means of one bolt and nut the cylinder of the pump can be secured to the flange sufficiently tight to make a joint between the end of the cylinder and flange. This joint is made by letting a portion of the valve-leather extend between the end of the cylinder and surface of the flange. The nut of the bolt, which bolt comes up through the recessed flange for holding the cylinder to the flange is made conical, and passes against the side of the cylinder at an angle, and thereby forces the end of the cylinder against the flange.

Two or more projecting lugs are cast around the recess in the flange, against which lugs the dovetailed sides at the end of the cylinder are forced by the angular or lateral pressure of the conical nut.

The lugs are so shaped that they direct the end of the cylinder of the pump against the plate, when the pressure is applied by screwing the conical nut, and thereby forms an evenly tight joint between the whole surface of the cylinder-end and flange. By loosening the conical nut the cylinder can be placed or turned to any position for placing the discharge-spout where desired, and the cylinder-valves and working parts can be entirely removed by taking off the nut. The cover or flange for the top of the pump is similarly constructed and attached by means of one bolt and nut. The lever is joined to the cover of the pump, and, consequently, can be turned around and held to any point within the range of its motion.

65.—JOHN WELSH, of the city and co. of Perth, N.B., superintendent of police and inspector of lighting, for "*An improved method of lighting street and other lamps, and in the apparatus or means connected therewith.*" Patent dated Jan. 9, 1865.

This improvement relates essentially to a very simple apparatus, to be used for the lighting of street and other lamps, and has for its object the entirely doing away with the ladders now in use, and not only to enable the lamplighter to reach and light the lamps with greater ease, but also to enable him to light a much greater number in the same period of time than he has been able to do hitherto. It also has for its object the enabling of private parties to light their gaseliers, lobby-lamps, stair-lights, shop-window lamps, lamps in the front of public and private houses or buildings, and lamps otherwise situated, without the use of steps, ladders, or chairs, and consequently the doing away of the great inconvenience and danger now attending these and other modes.

The apparatus consists of a hollow stem or tube, fixed to a rod or handle, which the lamplighter carries in his hand. Within the hollow part of the stem there is arranged a sliding rod, acted upon by a spring, also in the interior of the stem; this spring maintains the rod by its pressure in the lowest or uppermost position, which it is capable of assuming within the tube. At the lower end of the tube a slot is made, and through this slot a nob or handle passes, connected to the interior sliding rod, the use of the nob being that the thumb or finger may be applied to it, and an upward or downward motion imparted to the rod.

In one modification the upper end of the sliding tube is formed with a vertical hole in it to receive a lucifer or other match, and the tube is extended above this point, and closed over on the top; its interior surface being roughened, so that when an upward motion is imparted to the sliding rod the match is struck against the roughened surface, and at once ignited.

When used for lighting street-lamps, the apparatus holding the match is placed through the central opening at the bottom of the lamp, and when in proximity with the jet the percussion action is imparted to the rod, the match is ignited, and the fire communicated to the jet.

When used for lighting the lamps of public or private houses or buildings, the apparatus and the mode of proceeding is the same as when used for lighting street-lamps, but the apparatus is in general of smaller dimensions; the top of the rod carrying the lighting apparatus is fitted with a hook or key, which the person who carries the lighting apparatus places upon the usual thumb handle of the plug of the gas-cock, and by giving a lateral or vertical motion to the rod, the cock is turned, and the gas ready to be ignited.

85.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, in the co. of Middlesex, for "*An improved apparatus for cutting iron, gas, and other pipes.*" A communication. Patent dated Jan. 11, 1865.

The apparatus for cutting pipes, which is the subject of this invention, consists of a flat knife, which slides vertically in a groove, made in the body of a screw-threaded cylinder, or stock. This knife is governed in its movements by a nut, which penetrates into a notch made in the knife. A moveable bearing may be set in motion by a recall-screw, to which is fixed a wrench, and may thus be tightened against the pipe which it is desired to cut. This bearing is guided in its movements by two tennons, which may slide in a groove made along the apparatus. This new system of screw-stock has the great advantage of permitting the cutting of pipes of different dimensions with the same apparatus, by lifting more or less the bearing by the aid of the recall-screw.

151.—JOHN WILLIAM GREGG, of 18, Upper Sackville Street, in the city of Dublin, lamp manufacturer and gas-fitter, for "*Improvements in street and other lamps and lanterns.*" Patent dated Jan. 18, 1865.

This invention relates to improvements in lamps or lanterns, intended either for indoor or outdoor use, the object to be obtained being increased illuminating power, whether using gas, oil, or other inflammable fluid, without increasing the cost of burning, and without materially adding to the cost of construction. According to this invention, it is proposed to make the glass of the lamp or lantern, or that part which encloses and surrounds the flame, of a shape tapering downwards, and to form the sides thereof of bent glass, in lieu of flat panes, as hitherto adopted in street-lamps, whereby less resistance is offered to the wind. The top or dome of the lamp or lattern consists of an earthenware or china reflector, with or without a metallic covering, which is curved or otherwise shaped to suit the angle of reflection according to the position of the lamp. This reflector may or may not project or overhang beyond the circumference of the top of the lamp, and such projecting part may be made of tin or other bright metal on the underside, or painted white. Where gas is used, the tap or regulator may be situate near the centre of the lamp, and this tap may be either of the ordinary construction or it may consist of two concentric tubes, one moving up or down inside the other, and having a slot formed therein to serve as a guide. The gas is let in through the inner tube, when it is drawn down, and is shut off by pushing up that tube until it is arrested by a stop. At the bottom of the lamp or lantern there is fitted a trap-door composed of metallic gauze, which admits air freely, and affords access to the interior of the lamp or lantern when lighting. The hot air escapes through a suitable aperture at the top.

APPLICATIONS FOR LETTERS PATENT.

2503.—CHARLES FORSTER COTTERILL, of Cannock, Staffordshire, gentleman, for "*Improvements in connexions for and in stopping pipes used for conveying water and gas, and for other like purposes, and in preventing leakages in the said pipes; and in apparatus employed therein.*" Sept. 29, 1865.

2507.—JOHN ADDENBROOKE and GEORGE ADDENBROOKE, both of Darlaston, Staffordshire, ironmasters, and PHILIP ANTHONY MILLWARD, of the same place, engineer, for "*Improvements in collecting or drawing off the gases from blast-furnaces.*" Sept. 29, 1865.

2527.—SILAS COVELL SALISBURY, civil engineer, of New York, U.S.A, for "*Improvements in producing and combining gases to be used for heating purposes, and in the construction of retorts for producing and combining such gases.*" Oct. 2, 1865.

2544.—ALLAN CRAIG, of Leeswoodhill Colliery, Mold, Flintshire, for "*Improvements in apparatus for extracting oil from coal, shale, and other minerals.*" Oct. 4, 1865.

2549.—JAMES WEBSTER, of Birmingham, Warwickshire, engineer, for "*Improvements in gas-meters.*" Oct. 4, 1865.

2567.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, London, for "*Improvements in rotary engines and pumps.*" A communication. Oct. 6, 1865.

2580.—THOMAS VINCENT LEE, of Macclesfield, Chester, for "*Improved methods in the manufacture of candles from peat and petroleum, and also for the adaption of the same materials in combination with other chemical affinities for illuminating purposes.*" Oct. 7, 1865.

2603.—WILLIAM COOKE, of Park House, St. James's, Middlesex, for "*Improvements in sanitary window fittings.*" Oct. 10, 1865.

2609.—JOHN GARRISON WOODWARD, of St. John, New Brunswick, merchant, for "*An improved ventilating apparatus for use in steamboats, vessels, and other places requiring to be ventilated.*" Oct. 10, 1865.

2614.—RICHARD ABELL, of Cambridge Terrace, Pimlico, London, carpenter, for "*Improvements in trapping and ventilating sewers.*" Oct. 10, 1865.

2615.—JOHN JOSEPH PARKES, of London Street, Paddington, gas engineer, for "*Improvements in the manufacture of railway-station and other gas-lamps.*" Oct. 10, 1865.

2620.—JAMES CRUTCHETT, of Stroud, Gloucestershire, at present at Washington, U.S.A., for "*Improvements in the manufacture of gas.*" Oct. 11, 1865.

2622.—WILLIAM EDWARD GEDGE, of 23, Southampton Buildings, Chancery Lane, London, for "*Improvements in double or single action pumps.*" A communication. Oct. 11, 1865.

GRANTS OF PROVISIONAL PROTECTION.

2308.—ALEXANDER MACKIE, of Warrington, Lancaster, newspaper proprietor, and JAMES PATERSON, of the same place, engineer, for "*Certain improvements in the method of lighting gas, and in apparatus connected therewith.*" Sept. 9, 1865.

2415.—ALFRED BIRD, of Birmingham, Warwickshire, experimental and pharmaceutical chemist, for "*Improvements in purifying water.*" Sept. 21, 1865.

2435.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, London, gentleman, for "*Improvements in generating illuminating gas, and in the machinery or apparatus employed therein.*" A communication. Sept. 23, 1865.

2439.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, London, mechanical draughtsman, for "*Improved apparatus for generating illuminating gas.*" A communication. Sept. 23, 1865.

2451.—Edward Brooke the younger, of Huddersfield, Yorkshire, manufacturer of sanitary tubes and other fire-clay goods, for "*An improved arrangement of apparatus and materials to be employed for effecting the deodorizing of the noxious gases arising from sewers and drains, and for the more effectual ventilation and inspection of such sewers and drains.*" Sept. 25, 1865.

2467.—John Hilliar, of Great Cambridge Street, London, manufacturer, for "*Improvements in apparatus for ventilating and for preventing down draught in flues.*" Sept. 26, 1865.

2489.—Arthur Rigg, jun., of Chester, for "*Improvements in centrifugal pumps and fans.*" Sept. 28, 1865.

2503.—Charles Forster Cotterill, of Cannock, Stafford, for "*Improvements in connexions for and in stopping pipes used for conveying water and gas, and for other like purposes, and in preventing leakages in the said pipes, and in apparatus employed therein.*" Sept. 29, 1865.

2527.—Silas Covell Salisbury, civil engineer, of New York, U.S.A., for "*Improvements in producing and combining gases to be used for heating purposes, and in the construction of retorts for producing and combining such gases.*" Oct. 2, 1865.

NOTICES TO PROCEED.

1437.—George Bray, of Leeds, Yorkshire, clothier, for "*An improved gas-burner.*" May 25, 1865.

1458.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*Improvements in apparatus for measuring gas and other fluids.*" A communication. May 27, 1865.

1527.—Charles Taylor, of Birmingham, Warwickshire, machinist, for "*Improvements in tube-cutters and screw-cocks.*" June 3, 1865.

1534.—Thomas Gentle and Joseph Allmark, of Oldham, Lancaster, for "*Improvements in twebines.*" June 5, 1865.

1658.—John Scholl, of 41, Berwick Street, Soho, London, for "*Improvements in gas-burners.*" June 20, 1865.

2111.—James Billings, of Kentish Town, Middlesex, accountant, for "*Improvements in ventilators.*" Aug. 16, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2615.—John Raywood, "*Certain improvements in the construction of gas apparatus for the prevention of fraud, and for economizing the consumption of gas.*" Sept. 25, 1862.

2656.—George Haseltine, "*Improvements in the means for, and mode of warming and ventilating buildings.*" Oct. 1, 1862.

Miscellaneous News.

SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

The Half-Yearly Ordinary Meeting of Proprietors was held at the London Tavern, on Tuesday, Oct. 10—T. B. Simpson, Esq., in the chair.

The Secretary (Mr. Livesey) read the advertisement convening the present and the minutes of the last meeting. The seal of the company was affixed to the register of shareholders.

The following report of the directors was presented:—

The directors have much pleasure in again meeting the proprietors with a favourable report of the company's progress.

Since the meeting in April last the sanction of Parliament has been obtained to enable the company to hold additional land, and the directors have now to announce that they have exercised the power given them by purchasing, on favourable terms, about 13 acres, adjoining that part of the banks of the canal which is held under lease from the Surrey Canal Company.

During the summer the retort-house has been considerably extended, and there is now in course of erection an additional number of retorts to meet the constantly increasing demands of the public.

In the course of next year it will probably be necessary to set the whole of the retorts in the new house, and to erect a new gasholder, the outlay for which will not be less than £10,000.

The profits for the half year to June last being in excess of the amount required for the payment of the parliamentary dividend, the directors, in accordance with the Metropolis Gas Act, made a further reduction in the price of gas from midsummer last.

The proprietors will doubtless be gratified to hear that the business continues to be conducted to the satisfaction of the several parishes in the company's district, and also to the consumers generally. The gas supplied has always been above the parliamentary standard, and free from the impurities of ammonia and sulphuretted hydrogen.

By the accounts to be submitted to the meeting, it will be seen that the revenue for the half year to the 30th of June last, amounts to £47,491. 13s. 4d.; and the expenditure for the same time to £35,885. 18s. 10d., leaving a balance of £11,605. 14s. 6d. for the payment of the dividend, at the rate of 10 per cent. per annum.

On the motion of the Chairman, the report was received, and ordered to be entered on the minutes.

The Secretary read the following statements of account:—

Dr. *Working the Establishment, to June 30, 1865.* *Cr.*

To Gas-rental—				By Directors and auditors			
Public	£ 5,493	17	0		£	650	0 0
Private	29,946	17	0	Salaries and commissions		1,692	18 5
	£35,440	14	0	Rent and taxes		1,672	8 8
Residual products—				Sundries		674	10 5
Coke	£8,768	6	8	Supervision and labour		5,409	1 9
Breeze	404	2	3	Tools, implements, &c.		408	4 5
Tar	1,193	11	6	Repair and maintenance		1,467	8 4
Liquor	307	6	3	Purifying and labour		314	16 3
	10,673	6	8	Main-pipes		946	17 10
Sale of old materials	78	13	2	Service-pipes		737	14 1
Miscellaneous receipts	1,298	19	6	Meters		1,114	11 1
				Distribution		2,575	18 5
				Law charges		591	2 0
				Bad debts and allowances		183	11 5
				Coals carbonized		17,446	15 9
				Balance		11,605	14 6
	£47,491	13	4		£47,491	13	4

Dr. *Balances, to June 30, 1865.* *Cr.*

To Capital	£200,000	0	0	By Works and plant	£168,984	8	3
Reserve-fund	20,000	0	0	Stock—			
Investment-fund	7,002	17	4	Coals	£5,323	2	6
Revenue account	18,040	2	3	Mains	382	13	7
Unclaimed dividend	169	9	0	Meters	1,625	0	0
Payments in advance	298	2	6	Products	53	16	8
Sundry creditors	3,307	11	1		7,384	12	9
				Amount due to company—			
				Gas	£13,756	19	11
				Products	1,047	6	9
				Sundries	204	19	0
				Interest	545	17	8
					15,555	3	4
				Bankers	15,865	8	1
				Cash in hand for freight and petty ditto	229	0	0
				Investment—			
				Consols—reserve-fund	20,000	0	0
				Ditto	6,893	9	9
				Reduced Three per Cents.	915	0	0
				New ditto	13,000	0	0
	£248,818	2	2		£248,818	2	2

The Chairman said—In asking the proprietors to pass these accounts, he could assure them that the directors met their constituents with the utmost satisfaction. For many years past their meetings had been of the most agreeable character, and it had been his repeated privilege to congratulate them upon the soundness of their undertaking, and the success of their operations. He felt that on this occasion he could again, with confidence, assure them of the stability of the concern from beginning to end. Their customers were, he believed, thoroughly contented, and the shareholders themselves had nothing to complain of, for they received all that the law allowed them to take. True, it was somewhat grating to their feelings to know that the business in which they had embarked their capital was earning a great deal more money than they were allowed to divide, but then they must remember that this restriction was attended with some little advantages. The result of the arrangements out of which it arose was, that they got rid of all those heart-burnings and contentions with which, in former times, they were familiar. To a large extent their path was now a perfectly smooth one, for the irritation which once attended their relations with other companies when competition existed was at an end. With regard to their new Act of Parliament, he remarked, that the directors under its provisions had negotiated the purchase of an additional piece of land, the conveyance of which was now complete, and the deeds in the possession of the secretary. It would be very gratifying to the proprietors to know that they had thus acquired the means of carrying out any improvements which might be desired, and of meeting any increased demand that might be made upon them. He concluded by moving—"That the accounts just read be received and entered on the minutes."

The motion having been seconded,

A Proprietor inquired what price the company now charged for gas.

The Chairman: 3s. 4d. per 1000 cubic feet.

Mr. Gray said it appeared to him that all the ways of this company were pleasantness, and all its paths were peace. He was much gratified at its continued prosperity; nevertheless he could not help reflecting upon the fact of the great injury which this prosperity was inflicting upon the other companies in London. Speaking as the chairman of one of those companies, he did not envy the South Metropolitan their great success, but he confessed that he should have been much better pleased had that success not been so conspicuous, for it was a constant source of uneasiness and agitation in other places. He need hardly remind his friend in the chair, that for a long period after their establishment this company paid no dividend at all. To that circumstance must be in some degree attributed the small dividend-paying capital invested in the undertaking. He thought the equitable course would be to open a debtor and creditor account with the old shareholders, and carry to the credit of that account the amount of dividend they ought to have received when they ceased to be proprietors. It was mainly to the circumstance he had alluded to that there had been such a great accumulation of wealth; the company had been, in fact, carried on by appropriating for the erection of works the money which should originally have been divided among the shareholders. That being the case, it could not be a matter of surprise to any of those whom he now addressed

that other companies, who had constructed their works by making calls upon their proprietors, were not in such comfortable circumstances as the South Metropolitan. He was pleased to hear the chairman say that their customers were contented, for it really was a most difficult matter—almost an impracticable one—to please the public, there being so many schemers about, so many people ready to interfere with the property of others, who exercised a certain influence over the public mind, regardless altogether of the effect which their rash statements might have upon the interests of those who had invested their capital in hazardous undertakings of this kind. As a consumer of gas in this company's district, he could speak to the excellence of the gas supplied, and to the general attention of the board to the convenience and wants of their customers. He asked the chairman whether the directors had acquired the freehold of the site on which the works were erected.

The CHAIRMAN said they had not, but they were now in treaty for it.

The motion for the adoption of the report was then put, and carried unanimously.

The CHAIRMAN moved—"That a dividend at the rate of 10 per cent. per annum be now declared, and made payable at the company's bankers on and after Thursday next, the 12th inst."

The motion was put, and carried.

Mr. PAUL moved—"That to enable the directors to give effect to the resolution of the 11th of April last, their annual allowance be at the rate of £1200 from Christmas last, and to continue during the pleasure of the proprietors."

Mr. GRAY seconded the motion, which was unanimously adopted.

A cordial vote of thanks to the directors was then passed.

The CHAIRMAN, in acknowledging the vote, said the repeated proofs of kindness and confidence which the proprietors displayed were most grateful to the feelings of the board. The directors were always desirous to perform their duties with energy, perseverance, and integrity, and it was in the highest sense satisfactory to them when they found their exertions approved by the shareholders.

Mr. GRAY moved, and Captain HENNING seconded, a vote of thanks to Mr. Livesey for his able superintendence of the affairs of the company.

Mr. LIVESEY, in acknowledging the vote, which was very heartily responded to, said he was always desirous to do the best he could for the interests of the company, and he was gratified in knowing that his efforts were appreciated. He had been nearly a quarter of a century in the service of the company, and he hoped for the next ten or fifteen years he should still fulfil the duties of the office which he now held, with satisfaction to the proprietors.

COMMERCIAL GAS COMPANY.

The Half-Yearly Ordinary Meeting of the Company was held on Friday, Oct. 6, at the London Tavern, CHARLES SALISBURY BUTLER, Esq., M.P., in the chair.

The CHAIRMAN read the advertisement convening the meeting, and affixed the corporate seal to the register of proprietors.

The SECRETARY (Mr. Jaques) read the minutes of the last meeting, and the following report and statement of accounts was then presented:—

The directors have much pleasure in submitting the accounts of the company, as certified by the auditors, for the half year ending June 30th last.

It will be observed that the net profit amounts to £25,418. 5s. 3d., which the directors recommend should be appropriated as follows, viz.:—the payment of a dividend at the rate of £5 per cent. for the half year, less income-tax, and the investment of the balance, as directed by the Act of Parliament.

The directors have to report that the additional retort-house, coal-stores, with machinery and apparatus, referred to in the last report, are completed; the company are now in a position to meet the contemplated increase in the consumption of gas in the ensuing winter.

STATEMENT OF ACCOUNTS,

Showing the Actual State and Condition of the Concerns of the Commercial Gas Company, for the Six Months, ending the 30th day of June, 1865.

I. CAPITAL.—*State of the Account at the End of the above Six Months.*

Statute, or Authority, under which raised.	Number of Shares.	Amount per Share.	Paid up per Share.	Total Paid up.	Total Capital.
Shares	17,476-3/5ths. 13-4/5ths-1/20th.	£25 0 0 25 0 0	£25 0 0 Various.	£436,915 0 0 201 0 0	£437,116 0 0
	17,490-2/5ths-1/20th.				
COMMERCIAL GAS ACT, 15 & 16 VICTORIA, cap. 155.			Rate per Cent.	Amount.	
Borrowed moneys			4	....	500 0 0
				Total capital . .	£437,616 0 0

II. REVENUE.—*Account during the above Six Months.*

RECEIPT.			EXPENDITURE.		
Balance brought forward		£ 252 16 9	Management—		
Sale of gas—			Directors allowances	£ 750 0 0	
At 4s. 5d. and 4s. per 1000 feet	£54,246 10 7		Salaries of secretary and clerks	1,361 17 5	
Public lighting and contracts	7,319 13 9		Collectors commission and pay	912 19 5	
		61,566 4 4	Rent, rates, and taxes of offices	50 0 0	
Sale of residual products—			Stationery, printing, and general charges	889 13 10	
Coke	£9,594 19 6		Payment to auditors	75 0 0	
Breeze	456 15 3				£4,039 10 8
Tar	1,680 14 11		Manufacture of gas—		
Ammoniacal liquid	512 8 1		Coals, including carriage, dues, &c.	£29,502 5 4	
		12,244 17 9	Purifying materials	1,337 9 5	
Miscellaneous receipts		727 6 4	Supervision and labour	9,086 1 4	
			Tools and other implements	106 12 9	
			Ordinary repair and maintenance of premises	2,157 19 3	
			Rents, rates, and taxes of manufactory	1,115 10 6	
					43,305 18 7
			Distribution, including service-mains, pipes, &c.—		
			Ordinary repair and maintenance		1,439 19 4
			Meters—		
			Restoring and replacing		565 18 3
			Law and parliamentary charges	£ 11 17 3	
			Interest paid from profits on £500, borrowed capital, at 4 per cent.	9 15 10	
					21 13 1
			Balance for shareholders profit		25,418 5 3
		£74,791 5 2			£74,791 5 2

We have examined the above accounts, and certify them to be correct.

CHARLES SALISBURY BUTLER, *Chairman.*
GEORGE JAQUES, *Secretary.*

The CHAIRMAN: It has been my privilege for many years to address a few words to you on moving the adoption of the report. I consider it a useful custom, for it has enabled me to explain to you the events of the preceding six months—events frequently of an important nature. We have from time to time taken counsel together, and the result has invariably been that we have been strengthened by your approval and confidence, and so we have proceeded with our work with renewed energy and satisfaction. On the present occasion, I am afraid I must admit that I have but little to communicate to you, but the little being of a satisfactory character, I hope you will not object to it on the score of brevity. Since I last had the pleasure of addressing you in this room, our attention has been principally directed to the working operations of the company, and the extension of our apparatus, in order to meet the requirements of the approaching winter. Our report informs you that these important works are now completed. And I am bound in justice to add, that they reflect great credit upon our engineer, Mr. Jones; I must, however, ask some little credit for my colleagues in the direction for having, after much thought and deliberation, resolved upon taking a comprehensive view of these important works. It is not often that I speak to you with reference to the exertions of my colleagues—indeed, I am not sure that I have ever done so; but I trust you will believe that there are times when it is as justifiable for the chairman of a company to mention the exertions of those who are associated with him in the direction, as it is to speak of the merits of the various officers. I know you will excuse me for saying that I think great credit is due to my friends for having so perfected their arrangements as that these works should be completed some time before they were actually required for use, for you are well aware that it would have resulted in a considerable loss to us, had we been compelled to place fires under the retorts immediately the settings were complete. Now all will be seasoned and dry, and I believe I may confidently assure you that we are quite able to meet all the requirements of the carbonizing department during the coming winter. Of course it is impossible to predict with accuracy what the increased consumption in the future may be. Our area of supply is large, buildings are being put up in every direction, and, as gas is now required in private houses as well as in shops, it is absolutely necessary that we should be prepared with considerable surplus capabilities. With reference to our *working operations*, and the accounts for the past half year, I may observe that our capital account shows an extension of £9566. 0s. 10d. under the heads of plant, mains, services, and meters. Should you wish to have the items under each head separately, I have them here, and it will afford me pleasure to give you any explanation that may be required; at the same time, I do not wish to occupy your time unnecessarily. The item of meters is undoubtedly a large one, and, seeing that it is entirely dead capital, it deserves some notice. It now stands at £25,888. 4s. 9d., and that large sum represents our investment in meters for the gratuitous use of the public—our customers. For this, I repeat, we make no charge, either directly or indirectly, although we are authorized under the Metropolis Gas Act to charge the consumer 10 per cent. on the actual cost for the use of these meters. Well, gentlemen, when we add the cost of repairs, no inconsiderable item, it will be seen that we are really supplying the public with gas at a very reduced price, and for which, I fear, we scarcely get the credit we deserve. Our rental for the past six months amounted to £61,566. 4s. 4d., for the corresponding period ending June, 1864, it stood at £59,939. 2s. 7d., showing an increase of £1627. 1s. 9d. But you should bear in mind that the rental was reduced in March last to 4s. per 1000 cubic feet, so that, on the whole, you will be of opinion that this increase of our rental is very satisfactory. Our principal item of expenditure is, of course, for *coal*, and here the figures are larger than they have ever

been. The gross, including cannel, is £29,502. 5s. 4d., while for the corresponding half year the payments were £28,903. 4s. 2d., showing an increase of £599. 1s. 2d., partly due to the additional average price of 1d. per ton, and, of course, partly due to the increased consumption of gas. On placing the additional receipts for rental in juxtaposition with the additional payment for coal, you will not have reason to complain of the results in the carbonizing department. You have in the statement of accounts the items of receipts for *residual products;* they amount in the aggregate to £12,244. 17s. 9d. I only advert to it in order to place the item for the corresponding half year of 1864 before you. It then stood at £11,968. 11s. 4d., showing an increase of receipts of £276. 6s. 5d. It would have been more satisfactory had not the price of coke averaged 4½d. per chaldron less, and which, in itself, forms a considerable item. The *unaccounted-for gas* shows a trifle over 10 per cent. loss. I think this must be considered satisfactory, even to my friend Mr. Rhodes. I own I am surprised that it is so small, and I believe we must not expect to see it at a much lower per centage. I believe, gentlemen, I have now touched upon the several matters mentioned in our report and accounts. You will be glad to hear that there is a total absence of complaint throughout the district; indeed, our consumers appear to be satisfied that we are using every exertion in our power to give them a good supply. Like all respectable tradesmen, it is our anxious endeavour to supply a good article at the lowest remunerating price; and—thanks to the Act of Parliament which is now operating so advantageously to the gas consumers of the metropolis—we have been able very materially to reduce the price, and at the same time to increase the quality. Had there been competition in the district, I need scarcely say that these satisfactory reductions would have been impossible. For, what with the extra capital involved in two companies to do the work of one, the additional leakage and losses on the mains and services, and the large amount of extra labour and additional officers, from the directors to the lowest officer on the staff, I have no hesitation in saying that, had there been competing lines of main through the district, a very serious additional burthen would have been thrown on the gas-consuming public. I know it has been thought, even by some of our gas-consuming friends, that we have been somewhat premature in reducing the price; they have argued that we ought first to lay by to, and form the reserved fund contemplated by the Act of 1860, which regulates the price of gas througout the metropolis. It is no doubt true that we were legally and morally authorized to secure this reserve-fund, in order to provide for the contingencies of a hazardous business; and, if one company more than another was entitled to their rights under the Act, it surely must be a company whose proprietors were for years, in consequence of competition, without one farthing of dividend on their capital. Well, gentlemen, this is no doubt true, but we must look for our reward in the good feeling of our consumers. They know that we are working for them quite as much as for you, and I unhesitatingly say that, adopting this course of procedure, we are entitled to count upon the goodwill and support of the gas consumers of this district. I believe we have their confidence—I know we deserve it; and if, in addition, we have your approval, we have nothing more to wish for. I now beg to move that the report and accounts be received, adopted, and entered on the minutes of our proceedings.

Mr. Rhodes seconded the motion.

Mr. Gray hoped that he should be permitted, for a short time, to trespass upon the attention of the meeting He had listened with great pleasure to the lucid statement made by the chairman, who had spoken with satisfaction of the past and with hope as to the future. He fully concurred with the chairman as to the propriety of conciliating their customers. For his own part, he was always prepared to concede whatever was fair and reasonable; but he found too often, as the chairman himself must have found likewise, that it was no easy task to satisfy some people. The community at large was not unreasonable; but it so happened that not unfrequently there was a power exercised over the public mind by a few speculative individuals, who, having nothing of their own at stake in the matter, seemed to take a delight in trying how far they could depreciate the value of the property of others. There had been examples of this sort on two or three occasions in the Court of Common Council. One great reformer in that body had made a statement which probably would surprise many persons present. It was to the effect that the residual products from the manufacture of gas were of sufficient value to give an ample dividend to the shareholders in gas companies, who ought to supply the public with gas for nothing. He (Mr. Gray) would ask whether a person who could hazard such a statement as that was a proper person to occupy a seat in the City parliament. He thought not; but rather that he was a fitting candidate for Hanwell Asylum. It appeared that by a vote of the corporation, it was intended to apply to the Legislature next session for power to buy up the mains of the companies now supplying the City of London. They all knew that pipes and mains were of no use to a company unless they had gas to send through them; but he should like to know what would be the position of the companies if the corporation obtained power to take their pipes away from them. The proposition was just as reasonable as it would be to say to a man who earned his living by a horse and cart: "I will take your horse from you at a price, but I will have nothing to do with your cart." The man would be a fool to part with the one without the other. He (Mr. Gray) was quite prepared to say, if the corporation are willing to buy the gas-works, let them have them; but he could not assent to any such proposition as that of their purchasing the mains only. Fortunately for the Commercial Gas Company, they had little or nothing to do with the corporation; unfortunately for him, he had had a great deal to do with them. In his experience he had found them very much like the soldier who was ordered to be flogged. The poor fellow who inflicted the punishment was anxious to accommodate the culprit as much as he could, but in vain; for, whether he flogged high or low, there was no pleasing him. The gas companies supplying the City were desirous of conciliating the authorities, and had not been sparing in their endeavours to do so; but there was no satisfying them. The chairman had very properly reminded the proprietors that, though this company had reduced the price of gas, it was not because they had made exorbitant profits, and that for many years they paid no dividend at all. He (Mr. Gray) thought that, under such circumstances, the company would have been fully justified in keeping up the price; at the same time, he believed the directors had adopted a more judicious course in consulting the interests of the consumers, and making the reduction. As representing one of the metropolitan gas companies, he could only say that, whenever he found himself in a position to do it, he should most cheerfully assent to a reduction. With reference to the statement made by the chairman as to the large sum expended by this company—£25,888—for meters, he thought it was one the importance of which should not be overlooked. No doubt, if the companies felt it to be expedient to charge a rental for the use of meters—which they had a perfect right to do under the Act of Parliament—it would make a difference of something like 2d. or 3d. per 1000 cubic feet in the price of gas to the consumers. It always appeared to him an extraordinary thing that gas companies should supply a measure for the article they dealt in, and yet receive no remuneration for it. Such a thing was unknown in any other trade. There was another point to which he would allude, because it was one which might seriously affect the companies. Every one present knew that there was a great agitation at the present time among the working classes on the question of wages. That agitation was extending to persons engaged in the manufacture of gas, and no doubt before long the companies would have a considerable increase in that item of expenditure. This was a matter which must be borne in mind in connexion with the price charged for gas. There was a further question affecting the companies which was being revived by the Metropolitan Board of Works. He believed that they were about to apply to Parliament again for powers to compel the companies to place their mains in subways. Happily the Commercial Company would not be affected by such a measure. On the last occasion when it was introduced, all the companies except this one opposed the bill, and he (Mr. Gray) would have been pleased if the Commercial Company had been associated in that opposition. There was a long and expensive parliamentary inquiry upon the subject, the result being that in the case of gas and water companies the committee decided not to give the board compulsory powers, leaving it to the companies to exercise their own discretion whether they would make use of the subways or not. The companies supplying the City of London had expended large sums of money in laying their mains in the ground, and to have diverted them and placed them in subways would have involved a considerable outlay, no portion of which would have fallen upon the Board of Works. The companies, however, were willing that the board should have the powers they sought on condition that they were indemnified from any loss which might be sustained by explosion. The board would not accede to this proposition; they required that not only should the companies take the risk of accident, but also pay an annual rental for the use of the subways. He asked whether that was reasonable or right. Without trespassing much further upon the time of the meeting, he would venture to congratulate the shareholders upon the present prosperous state of their affairs, and to express his sincere hope that nothing would interfere to mar that prosperity. He was sure that everything had been done, and would be done, by the directors to conciliate their customers, and that in doing so they would not do any injustice to the proprietors at large Allusion had been very properly made by the chairman to their excellent engineer. He (Mr. Gray) believed that a more efficient man than Mr. Jones could not be found in connexion with any of the gas companies of London. While giving all due credit to the engineer, the chairman had reminded the shareholders that they must not overlook what was due to the directors. He quite agreed in that remark, because it was quite clear that however competent the engineer might be he could do nothing without the concurrence of the board. One thing was essentially necessary—viz., that money should be provided to carry the works into execution, and this department belonged especially to the directors. Everything appeared to him to have been well done, and the time he hoped was not far distant when the company would be in a position to make preparations for contingencies by laying by a reserve of 10 per cent. upon their capital. This was a prudential measure which the Legislature had sanctioned, and which he hoped the companies generally would strive to carry into effect, for no one could possibly tell what might occur. A serious fire took place some time ago in Leicester Square, where property to the amount of £40,000 or £50,000 was destroyed, and proceedings were now pending against the Chartered Gas Company, whom it was sought to make liable for the whole of the damage. It unfortunately happened that at the present time juries were too ready to listen to the evidence against gas companies, and were very unwilling to receive evidence which exempted them from blame. This was the case on the recent trial in which the Phœnix Company were concerned, and the result was that the poor companies too often went to the wall. Notwithstanding all their disadvantages, however, he hoped they would still be able to look their opponents in the face, and to maintain and improve their position.

A Proprietor inquired whether it was the practice of this company to supply more than one meter to each consumer. He understood that the company supplying the City had come to the resolution not to do so.

The Chairman said the Metropolis Gas Act only contemplated the supply of one meter to each consumer, and the general practice of the company accorded with that provision. But there might be instances in which it would be desirable, both for the company and for the consumer—as in the case of large gardens detached from a building, where there would be difficulty in getting all the supply through one meter—that a second should be provided.

Mr. Box said his growing infirmities of body had prevented his analyzing the accounts of the past half year, as he had been wont to do, in order to ascertain whether the increased revenue corresponded with the increased quantity of coal consumed. He would only remark that the statement made by the chairman as to the per centage of unaccounted for gas was most satisfactory. This was a question which of all others it was desirable to agitate at meetings of gas companies; its importance could not be overrated, as he felt sure the engineer would readily admit.

The motion was then put, and carried unanimously.

The Chairman moved—"That, pursuant to the recommendation of the board of directors, a dividend at the rate of 5 per cent. for the half year ending the 30th of June last be declared, and that cheques for the same be forwarded to the shareholders on Monday, the 9th inst."

Mr. Box asked whether the dividend was free of income-tax.

The Chairman: No, it is not.

Mr. Box: Then I ask why not?

The Chairman: And I ask why not? I think that it ought to be so. But, on looking carefully over the Act of Parliament, we are constrained to arrive at the conclusion that it would be an illegal payment. We have taken the opinion of counsel upon the subject, and, though we should be glad to pay the dividend without any deduction, we believe we should not be justified in doing it.

The motion was carried unanimously.

Mr. Gray proposed, and Mr. Box seconded, a vote of thanks to the chairman, deputy-chairman, and directors, for the great attention shown by them to the interests of the company.

The motion was cordially adopted.

The Chairman said it was a great encouragement to every one of the directors to know that their humble exertions as a board were appreciated by the shareholders at large, and he could assure the meeting that it was a great incentive to fresh zeal in the performance of their duty. He earnestly hoped that they would continue to receive these repeated marks of confidence and respect, and that the future meetings of the proprietors would be as harmonious and satisfactory as the present had been. He believed

the business of the day was now at its close, with the exception of the recognition of the services of the auditors, who had been very zealous in the discharge of their arduous duties.

A vote of thanks to the auditors was then adopted, and the same having been acknowledged by Mr. Marsh, the proceedings terminated.

LONDON GAS COMPANY.

The Half-Yearly Meeting of Proprietors was held on Wednesday, Oct. 11, at the Company's new works, Nine Elms—DANIEL SPRAGUE, Esq., Deputy-Governor, in the chair.

The CHAIRMAN opened the business by expressing his regret that, through indisposition, the governor of the company was not able to be present, and that in the absence of Mr. Hawkins it fell to the lot of no better person than himself to preside over the meeting. He could only assure the proprietors that his best services were always at the disposal of the company, and that on this occasion he would endeavour to conduct the business to their satisfaction. He must, however, throw himself upon the indulgence of the proprietors, having been called upon rather suddenly to occupy that position, and knowing that he was not so familiar with every detail of the working of the concerns of the company as his respected friend, Mr. Hawkins, was.

The SECRETARY (Mr. Hinde) read the advertisement convening the meeting, and the corporate seal was affixed to the register of shareholders.

The following report of the court of directors, with the statement of accounts for the half year and the balance-sheet, was then presented:—

Your directors submit to you the half-yearly accounts, showing the result of the manufacture and distribution of the company's gas up the 30th day of June last; a copy of the balance-sheet, and a statement of the profit and loss for the past half year, are annexed to this report. It will be seen that, after appropriating £750 to the redemption-fund, in accordance with the provisions of the "London Gaslight Act, 1857," the sum of £30,624. 3s. 7d. remains applicable to dividend. Out of that sum, the dividends upon all classes of preference shares and stocks will be paid on or after the 16th inst.; and the directors recommend that a dividend of £2. 10s. per share, being at the rate of 10 per cent. per annum, be paid upon the ordinary shares paid up in full.

In the reports for the past several half years, reference has been made to the progress of the new works at Nine Elms.

The directors, finding them now so far advanced towards completion, and having adequate accommodation for holding the general meeting, have upon this occasion determined to hold it at the offices of the works at Nine Elms, and thus to afford the shareholders the opportunity of witnessing for themselves in what the moneys for some time past retained have been expended. The ultimate result will be, when complete, works which, it is confidently believed, are nowhere to be excelled, if even to be equalled. The directors feel justified in this belief, and congratulate the shareholders upon their now possessing such valuable works erected upon freehold ground, and from the operations of which, so soon as the whole is fully developed and in action, such successful working may be confidently anticipated.

The large gasholder, referred to in the last report as in course of construction, it will be seen is nearly completed, and will be available for the coming winter's supply, thus averting the peril to which in the last winter we were so fearfully exposed.

The increased capacity of the leading mains has been effected, so as to ensure a full supply, however large a demand we may have to meet. Additional means of supply to the northern portions of our district have also been secured by an arrangement with the London, Chatham, and Dover Railway Company, by which we have obtained the means of carrying across the river two 22-inch mains, thus ensuring adequate supply for any increased demand that can possibly arise. The alterations recently made at Westminster Bridge afforded an opportunity of laying a main of double the capacity of the one we had to remove, and this the directors also availed themselves of, though at great present cost; it is hoped that it will prove a very good investment in the end.

The shareholders will not be surprised at learning that the cost of the foregoing operations has been very large, and that some means must be devised of meeting it. It will be in the recollection of all, that in the spring of this year an attempt was made to procure an Act of Parliament, authorizing an increase of capital, and that it failed by reason of the Standing Orders not having been complied with, and the attempt must be renewed in the ensuing session.

In conclusion, the directors remark that they are not so much surprised that the profits of the company, as shown by the accounts, have somewhat fallen off, as they are at their success in overcoming all the difficulties the circumstances by which they have for some considerable time been surrounded have presented, and that they are still enabled to keep to the maximum dividend of 10 per cent., and feel confident that the future prospects of the working of the company will enable them to bear the coming reduction of the price of gas without material inconvenience.

Balance-Sheet, June 30, 1865.

Dr.				*Cr.*		
To Shares—				By Plant		£624,526 2 0
6949 ordinary	£347,450 0 0			Meters in use		16,111 7 11
565 blue preference	28,250 0 0			Goods and products in store		14,483 11 3
214 red ditto	10,700 0 0			Amount to receive on shares		3,893 15 3
	£386,400 0 0			Ditto owing for gas	£34,090 15 11	
5608 first ditto	140,200 0 0			Ditto owing for coke, &c.	6,876 4 5	
		£526,600 0 0		Ditto owing for house-rent	1,677 2 8	
Debenture stocks		30,385 10 0		Ditto owing for sundries	1,644 8 8	
			£556,985 10 0			44,288 11 8
Loans			107,525 0 0	Cash in hand		11,912 16 9
Trade and other debts			44,417 14 6	Amount of debenture stocks, as per contra		30,385 10 0
Unpaid dividends		£1,916 2 8				
Interest on shares, 1845		380 16 11				
			2,296 19 7			
Redemption-fund			3,722 7 2			
Balance of profit, viz.—						
From previous half year		£30,346 11 7				
Half year ending June 30, 1865		23,452 11 2				
		£53,799 2 9				
Dividends, April 15, 1865—						
Preference shares	£ 5,303 5 0					
Debenture stocks	859 4 2					
Ordinary shares	17,012 10 0					
		23,174 19 2				
			30,624 3 7			
			£745,601 14 10			£745,601 14 10

Profit and Loss, Half Year ending June 30, 1865.

Dr.			*Cr.*		
To Coals		£33,991 13 11	By Gas, &c.		£79,375 15 0
Wages		11,886 14 0	Coke and other products		22,672 3 9
Tradesmen's accounts		9,751 18 7	Rents		655 3 7
Meters—repairing and fixing		945 0 4			
Directory and auditing		800 0 0			
Salaries		2,253 10 0			
Rates and taxes		1,655 17 3			
Rents		819 19 0			
Commission		1,341 0 4			
Stationery		133 1 10			
Incidental expenses		1,208 5 6			
Allowances and bad debts		315 6 0			
Law and parliamentary expenses		199 9 0			
Depreciation		10,809 12 6			
Balance		26,591 14 1			
		£102,703 2 4			£102,703 2 4
Interest on borrowed money		£ 2,389 2 11	Balance brought down		£26,391 14 1
Redemption-fund		750 0 0			
Balance		23,452 11 2			
		£26,591 14 1			£26,591 14 1

Dividend-Fund.

Dr.				*Cr.*		
To Amount of preference shares dividend, April 15, 1865	£ 5,303 5 0			By Surplus profits, Dec. 31, 1864		£30,346 11 7
Ditto debenture stocks	859 4 2			Balance as above		23,452 11 2
Ditto ordinary shares	17,012 10 0					
		£23,174 19 2				
Balance		30,624 3 7				
			£53,799 2 9			£53,799 2 9

The CHAIRMAN said it now became his duty to move—"That the report of the directors and the accounts laid before the meeting be received and adopted." In performing this office on the present occasion it was not his intention to inflict upon the proprietors a speech of any duration. He thought it was unnecessary to do so, and in this respect he should follow the excellent example always set by Mr. Hawkins, and not weary the meeting by any lengthened observations. Still a few remarks seemed to be almost called for, and he would commence by reiterating the congratulations expressed in the report, that the company were now in possession of works built upon freehold ground, and that they were not now in a situation ever to be subject to an eviction such as they had been subject to, and which, as the proprietors were all aware, had entailed upon them a very heavy loss. While, however, they must all regret the loss so sustained, he believed that in days yet to come that loss would be amply compensated by the superior working which would be able to be carried on in the new station, as compared with what was possible in the old. They were now in a situation to avoid the evil to which Mr. Price referred at the last meeting, when he said that the mains of all the gas companies were originally laid too small. That was almost a natural and necessary consequence in the case of a company just starting. They started with only a prospect of business, and it would be absurd for a company having a prospect of earning £10,000 a year to incur the cost of laying mains and erecting works adequate to the performance of a business of £100,000 a year. Therefore it was a necessity which almost always arose, that the mains laid at first were too small for the future requirements of a company; but in the present circumstances of this undertaking, having already a large established business, they had been able to erect the new works with the knowledge of that fact, and also with such experience as enabled them to judge of the probable extent of the demands that would be made upon them year by year. In the construction of these works they had been laid out upon a scale which was amply sufficient to meet the present requirements of the company, with capability, at a very small additional outlay, of being enlarged so as to provide for any demand which could possibly arise. He therefore thought it highly probable that the working of the company hereafter would be not only very satisfactory, but that it would be also highly profitable. Acting upon the principle which had guided the directors through-

out, the proprietors would see that a very large new gasholder had been erected. It was a question whether that gasholder should be of the enormous extent which the directors at last determined upon, or whether a smaller one, at less cost, should be put in its place. But the fact that the piece of ground upon which it was erected was admirably adapted to the construction of one of the present size, and that in the construction of a single gasholder of such a capacity, as compared with the cost of constructing two gasholders of half the capacity each, there was a saving of from £10,000 to £20,000, was a sufficient justification, in the opinion of the directors, for the course they had adopted; for, though they incurred the whole of this great outlay at the present time, it would clearly be an advantage to the company eventually that the additional cost he had mentioned should be saved, while it enabled them to provide at once for a storeage adequate to their utmost wants for several years to come without any further outlay whatever. Reference was also made in the report to the increased capacity of the leading mains. This was a matter, as he before stated, of the greatest importance; indeed, the directors were so impressed with the necessity of having mains adequate to the supply of the different districts, that they lost no opportunity, whenever it arose, of turning it to profitable account. Acting upon this principle, they had entered into an arrangement with the London, Chatham, and Dover Railway Company, to lay two 22-inch mains along their new bridge across the river. These mains were not immediately wanted, but as the business increased they would be found most valuable. The proprietors were aware that it was a very difficult matter to carry mains across the river, and that it was only on particular occasions that it was possible to do it. By availing themselves of the construction of the new bridge for the purpose, the directors would be enabled to supply every portion of the company's district with equal facility, and to provide for every demand which it was at all probable ever could arise. Then the report mentioned, and the proprietors would not be surprised to learn the fact, that the cost of all these reconstructions and arrangements had been very large. It could be easily imagined that such must be the case; the proprietors must be rather surprised, indeed, how in the world it had been done. If he were asked for an explanation he should feel himself at a loss to furnish it. All he could say was, that the directors had done the best they possibly could: they had availed themselves of all the means within their reach, and got a little into debt besides. The result was, that the company were now in possession of works which he believed were unequalled, not only by any gas company, but by any manufacturing establishment in the world. When the whole were complete, and in full action, they might defy competition or comparison. The proprietors were also aware that the company were in possession of a large quantity of unoccupied land. The houses between the works and the next street all belonged to them; and in some future time, when the present generation of proprietors were gathered to their fathers, probably those houses would have to be pulled down, and their sites added to the works. It would be seen, therefore, that there was capacity for vast extensions as they might become necessary. And then a very important element in their affairs was, that the company possessed water carriage up to the very doors of their retort-houses; and when everything was complete they would be able (as the report of Mr Watson, the engineer, which he would presently read, pointed out) to lift the coal from the barges, and by means of a tramway deposit it at the mouths of the retorts, instead of having to be at the heavy cost of landing, as at present. The last paragraph in the report referred to the prospective reduction in the price of gas. This was a very serious item, but notwithstanding its seriousness thedirectors trusted that they should be able to meet it without any material inconvenience. The reduction of price contemplated at Christmas next would amount to upwards of £15,000 per annum, and of course would do away with that excess of profits which of late years the company had been in the habit of laying by to meet the requirements of the construction of the new works. Hence the necessity for their going to Parliament for more capital. An honourable proprietor present (Mr. Price) had stated on former occasions that he believed they ought to have gone to Parliament long ago. He (the chairman) thought, however, that that gentleman was now convinced that it would have been undesirable, inasmuch as the company were already much overweighted with capital in comparison with other companies, and that they must continue to work under great disadvantage until they could get over that discrepancy. But the directors had, as might easily be imagined, incurred great liabilites in connexion with what had already been done, and the necessity was now imperative that they should apply to the Legislature for increased capital. This they would do immediately by giving the usual notices to that effect. In addition to the proposed reduction in the price of gas, which would considerably reduce the profits of the company, the directors had recently had an application from the workmen for an increase in the rate of wages. In the present state of the labour market, this was a matter which could not be resisted, and the directors immediately acquiesced on the best terms they could make. He would now advert to another subject, which in the ordinary course of things would have been referred to in the report. The indisposition, however, under which the governor had so long been labouring, the fact that he (the chairman) had himself been confined to his room for several weeks, and that at the present season of the year the directors of this, as of most other companies, were pretty generally dispersed, rendered it difficult to get a board meeting; otherwise the subject introduced by Mr. Gray on the last occasion would have been attended to earlier, and in that case the recommendation of the directors would have appeared in the report. On the last occasion Mr. Gray said he hoped, before the next meeting, the directors would take into consideration the propriety of increasing the salary of the secretary. Mr. Hinde's duties had very much increased of late years, and at present his salary was quite inadequate to the services he performed; and the governor said he was quite sure the directors would most cordially respond to any suggestion of the kind. In making that statement, Mr. Hawkins fully expressed the feelings of every member of the board, and he (the chairman) believed the feeling also of most of the shareholders. It was, therefore, intended to submit a resolution upon the subject after the passing of the one now before the meeting; and he had no doubt it would receive the hearty assent of the proprietors present. He would conclude by moving—"That the report of the directors and the accounts now laid before the meeting be received and adopted."

Mr. RHODES seconded the motion.

Mr. POOLEY wished to know what was the cost of the new gasholder, and also whether, in going to Parliament, the directors proposed to raise the same amount that was mentioned at a former meeting.

The CHAIRMAN said the board would most likely follow the same course that was proposed in the spring. The cost of the new gasholder in round figures was something under £30,000. If the board had erected two holders jointly possessing the same capacity, the cost would have been nearly £50,000. It was, therefore, to the advantage of the company that the directors should lay out £30,000 now rather than have the prospect of an ultimate expenditure of £50,000 to produce the same effect.

Mr. DOWNS thought it was a subject of congratulation that the works were now erected upon freehold ground of their own, and that though they had been turned out of their old works by the Duchy of Cornwall, they were now in a much better position and had greater conveniences and appliances for business than they could possibly have had at Vauxhall. He was glad, also, to find, on comparing the accounts of this company with those of the Phœnix and Imperial, that the cost of coal with reference to gas-rental presented a very satisfactory result. The item of wages, too, though they had been moving about, did not seem to have increased in the way he expected it would have done. The rate of expenditure under this head was not greater than that of the Phœnix Company, although much higher than that of the Imperial. The returns for coke and other products showed a very favourable appearance, so that upon the whole, though the gas-rental had not increased in the same ratio as before, they had reason to congratulate themselves that they were in a very substantial position.

Mr. GOOLD said he observed in the accounts an item, "Amount received on shares." He wished to know if there had been a reissue, and if so, whether they had been disposed of in the public market.

The CHAIRMAN said they were a few shares sold in the public market to the best possible advantage. He might explain that they were shares issued originally, but not paid upon, and not a sufficient number for any distribution, had it been necessary.

Mr. GOOLD: There were about 144 sold, I presume?

The CHAIRMAN: I can hardly tell you exactly at the moment, but that is not far off the number.

Mr. GOOLD: I have no doubt you got the best price you could.

The CHAIRMAN: We did. We struggled very hard to get more money, for we have been scratching everything we could together to convert into cash. The result is, as I have said, that we have kept up our character; have erected new buildings which we believe are unequalled, and that we are altogether in such excellent circumstances that we have not one moment's uneasiness, in looking forward to the future, that we shall not reap the fruit of our exertions.

Mr. GOOLD asked if the directors were in a position to say whether the new capital to be raised under the proposed Act of Parliament would be by first or second preference shares, or what rank they would take.

The CHAIRMAN replied that they were not in a position at present to say.

Mr. PRICE expressed his regret at the absence of Mr. Hawkins, and the sympathy he felt (and which he knew was shared by all the proprietors) with their excellent governor under his present indisposition. He then inquired when the proposed reduction in the price of gas was to take effect.

The CHAIRMAN said at Christmas next.

Mr. PRICE: What will be the charge for gas then?

The CHAIRMAN: Four shillings per 1000. The reduction will be 6d. per 1000, which is one-ninth of the present price, and upon a rental of £180,000 it is not difficult to calculate what the loss will be.

Mr. PRICE: I have always advocated the reduction, and I am only sorry you have not resolved to effect it from the commencement of the season.

The CHAIRMAN: I am afraid that is because you sit on one side of the table and we on the other. It would have made some thousands of pounds difference to us had we done so, and that is a matter of great consequence. We have heard no expression of dissatisfaction with the course we propose to adopt.

Mr. PRICE: I do not intend to argue the question again, but I have always maintained that reduction of price does not mean reduction of profit. With the large surplus of £20,000 which we have been laying by every year, I contend that it would be policy on the part of the company to reduce the price of gas from the commencement of the winter season. It would have stimulated the consumption very much, and it would also have disarmed the opposition of certain people who will always follow when anything like agitation is raised. I am glad, however, to know that the reduction is so near as Christmas. The question has been asked about how much capital you are going to raise. Last half year you told us that you were defeated in your bill upon Standing Orders. I hope the directors will this time be better advised by their parliamentary counsel.

The CHAIRMAN: We were in different circumstances then. We were anxious not to go to Parliament, but we found ourselves in a difficulty. We were in want of gasholder room, and were within ten minutes of utter exhaustion. In a quarter of an hour more, if our gasholders had not begun to rise, our district would have been thrown into darkness. It became absolutely necessary that we should apply for more capital, and we petitioned to have the Standing Orders suspended. That was allowed in the first instance, but afterwards the permission was withdrawn. We shall now go to Parliament in the ordinary way, and give the regular notices for that purpose.

Mr. PRICE said he thought the chairman had not laid too much stress upon the importance of having mains of sufficient capacity. He was glad to learn the steps which had been taken by the directors in this direction, and that they had availed themselves of the new railway-bridge across the Thames for carrying their mains into that portion of their district on the opposite side of the river. With reference to the unoccupied land adjoining the works, he hoped no steps would be taken to realize any portion of it.

The CHAIRMAN said there was not the slightest intention to do so.

Mr. PRICE wished it to be understood that he had not changed his opinion, as the chairman supposed, as to the propriety of an earlier application to Parliament. He believed the company would have stood a better chance of success if they had asked for additional capital while the works were in progress. As it was, however, he hoped they would get their bill, and, though the proprietors must now give up all idea of getting back dividends, that they would enjoy many years of uninterrupted prosperity.

Mr. POOLEY said he did not understand that the removal of the works was an increase of the property of the company, but merely a reinstatement of what they had lost.

The CHAIRMAN said that was exactly the case. They had been most unceremoniously ejected from their old works, which were leasehold; and the new works, which were on freehold ground, were a substitution for what they had lost. He would not take up the time of the meeting by entering upon the topics to which Mr. Price had called attention, but he might just say that it was a fact patent on that side of the table that by being ejected from their old works the company had made a possible loss of £160,000, which was so much of their capital gone to the winds. The first duty of the directors, therefore, was to take every means in their power to reinstate that capital as quickly as possible. This they had done by withholding back dividends, the payment of which, but for the Act of Parliament regulating such matters, never would have been thought of.

Mr. SAMUELS asked the meaning of the item in the balance-sheet "Amount to receive on shares."

The CHAIRMAN said they were shares issued long ago, upon which the first instalment only was paid, but which shares had not been forfeited.

Mr. PRICE said he observed that there was an increase in the amount to be received on these shares. In the last account it was £2952, and now it was £3093.

The CHAIRMAN said the difference was for the amount which was receivable upon some of the shares recently issued. That sum would of course be paid; the former amount they never expected to get. Perhaps it might be well for him now to read the report drawn up by Mr. Watson, the engineer, to which he had already alluded, as it gave an admirable description of the new works which had been constructed. It was as follows:—

The new works at Nine Elms stand on freehold ground, covering upwards of thirteen acres, bounded on the one side by the South-Western Railway, and partly on the other by Nine Elms Lane; there is, in addition, a river frontage of 170 feet.

The principal entrance to the works is by Hanard Street, at the corner of which the company's new offices are erected, comprising a board-room and accommodation for the whole staff of the company's officers.

The new retort-houses consist of three buildings, 60 feet wide and 194 feet in length; each house contains 144 retorts, 20 feet long and 16 inches in diameter; in addition to this there are 48 retorts in the house erected a few years ago. The total number of retorts are capable of producing 4,300,000 cubic feet of gas per day.

There are four principal coal-stores, built on each side of the retort-houses, and which supply coal through openings in front of the retorts, thereby avoiding the labour and expense of carrying coal out of stores.

The engines are high-pressure, each 25-horse power. The exhausters are those known as "Beale's;" their minimum capacity is equal to 150,000 cubic feet per hour. The engines, exhausters, and machinery are all duplicate. Attached to these engines are pumps, &c., for supplying water, pumping liquor, tar, &c. The engine and boiler house is built entirely fire-proof, and the roof is formed by one large water-tank, adequate to the whole requirements of the works.

The condensers are those known as "annular condensers;" the outer pipes are each 3 feet diameter and 26 feet in length.

The scrubbers are each 18 feet diameter and 20 feet high.

The purifiers are each 24 feet square and 6 feet deep.

The whole of this condensing and purifying machinery is equal to a produce of gas of upward of 4 million cubic feet per day, and so arranged that any additions can be made at small cost.

Under the purifying yard there is a large tar and liquor tank capable of containing 500,000 gallons; from this tank, pumps convey the tar and liquor to covered barges.

The dock for discharging coal from barges, loading coke, &c., is capable of holding fifty barges; the water is supplied from the river Thames by dock-gates, which are opened every tide for barges to enter or go out. The wharf runs parallel with the retort-houses, and as soon as these are completed, the coal-barges will lay alongside, and the coal discharged by machinery and a system of tramways, which will very much lessen the cost of unloading coal.

A large meter and governor house, with various offices, testing-rooms, &c., is erected in a convenient position; one large station-meter, equal to 100,000 cubic feet per hour, is now at work, and another will be erected next year. The company's districts are each supplied by a separate governor, whereby the pressure can be regulated according to the level of the districts.

Two gasholders, 150 feet diameter and 60 feet high, have been in work some time; they each contain 1 million cubic feet. A new gasholder, 205 feet diameter and 60 feet high, is in course of erection; its capacity is equal to 2 million cubic feet, making a total gas storeage on the new works of 4 million cubic feet.

The whole of the flues lead to the principal shaft, which is 130 feet high; it is built with an internal fire-brick shaft to a height of 100 feet.

A suitable residence for the engineer is in course of erection.

He thought the shareholders would be gratified to hear the report just read, and if they would take the trouble to go over the premises when the business of the meeting was concluded, he was convinced they would be amply repaid.

Mr. DOWNES asked whether the company had entirely settled with the Duchy of Cornwall.

The CHAIRMAN said the amount was settled and paid; and as attention had been called to the subject, he might mention that the directors believed the Duchy authorities had taken a great deal into consideration the position in which the company were placed by their ejection from the old works, and that in adjusting the amount of dilapidations, they had dealt very fairly with them. At the same time they thought, under the circumstances, that they had a strong claim for the remission of every penny, and an appeal had been made to the Duchy upon the subject. There was such a mass of property left upon the ground, and the company had sacrificed such an enormous sum to their whim (for they would have been glad eventually had the company remained), that it would be no great stretch of generosity if the whole amount for dilapidations were remitted.

After some further conversation the motion for the adoption of the report was put, and carried unanimously.

The CHAIRMAN moved—"That the dividends upon all classes of preference shares and stocks be paid on and after the 16th inst.; and that a dividend at the rate of £2. 10s. per share, being at the rate of 10 per cent. per annum, be paid upon the original shares paid up in full."

Mr. RHODES seconded the motion, which was put, and agreed to.

The CHAIRMAN said he had now to bring before the meeting the subject to which he referred in the close of his speech, and the proposal he had to submit was—"That in consideration of the long and valuable services of the secretary, John Rigby Hinde, Esq., and believing it is in full accordance with the sentiments of the general body of shareholders, the directors recommend that the remuneration of the secretary be increased to £1000 per annum." Resolved—"That the foregoing recommendation of the directors be adopted." In moving this resolution he could not forbear to give vent to his own feelings, and to express his belief that, in awarding to Mr. Hinde such a remuneration as this, that gentleman was by no means overpaid. Many of the shareholders were very familiar with the exertions of Mr. Hinde in carrying on the business of the company, but, of course, to the directors it must be much more intimately known what the value of those services were. It seemed an old fashioned thing to refer to, and he had had occasion at previous meetings to refer to it, but he could not forget the very valuable aid rendered by Mr. Hinde to the committee of investigation of which he (Mr. Sprague) was the chairman 18 years ago. All the circumstances attending the object of that committee he could not now explain, but the shareholders might take his word for it that the assistance which Mr. Hinde rendered them was of infinite value to the company, and led, he believed, to the prosperity in which they now rejoiced. At that period, as many of the old shareholders would remember, the company were in extreme difficulties. How it had ever been pulled through was to him a marvel. At that time Mr. Hinde had a salary of £500 a year, and he voluntarily proposed to the directors that, considering the exigencies of the company, they should retain £100 yearly out of that salary, which was done for several years. There were not many secretaries to be found of such metal as that. Amongst other difficulties of the company at the time, he might mention that they had to file a bill against the previous board of directors in connexion with matters long gone by, and Mr. Hinde became a very important witness in the matter. But he was not eligible to be a witness while he was a shareholder in the company, and at that period he was a considerable shareholder. The value of the shares was then only £5, and some had gone down as low as £2. Mr. Hinde sold his shares on that occasion at this reduced rate, sustaining all the loss himself. Bearing these facts in mind, he thought he had made out a sufficient case to justify the recommendation of the directors, and a fair claim on the part of Mr. Hinde, now that the company were in better circumstances, to be compensated for the losses which he had voluntarily sustained in the service of the company.

Mr. PRICE seconded the motion, which was at once, and most cordially, agreed to.

Mr. GOOLD expressed a hope that the services of the other officers of the company would not be overlooked by the directors.

The CHAIRMAN said they had not been forgotten. He believed that since he had been on the board their salaries had been pretty nearly doubled. For himself personally, and he was sure the other directors would sympathize in the remark, he thanked the proprietors very sincerely for the hearty manner in which they had responded to their recommendation.

The SECRETARY said: Mr. Chairman and gentlemen, the too flattering manner in which the augmentation of my salary has been proposed, and the kindness with which the recommendation of the board has been received, naturally impress my mind very deeply. I have nothing to boast of except an earnest desire to do my best to be an honest and efficient secretary. As long as I am in your service I hope I shall continue to be so.

A vote of thanks to the governor, deputy-governor, and directors, was then passed.

The CHAIRMAN, in acknowledging the vote, said it was not the first time he had been in the proud position of receiving the expression of the shareholders approbation. For himself and colleagues he thanked them cordially for the very kind manner in which upon all occasions they had been received, and for the excellent support accorded by the proprietors. To that support he mainly attributed the success of those efforts which the board had made to bring the company into its present position. He concluded by proposing a vote of thanks to the auditors, which was put, and carried unanimously.

Mr. DEELEY returned thanks, and in doing so said the auditors had received most valuable assistance in the performance of their duties from the secretary and accountant. The company were fortunate in having most efficient officers, and he had much pleasure in proposing a vote of thanks to them.

Mr. GOOLD seconded the motion, which was agreed to unanimously, and the secretary having acknowleged the vote the proceedings terminated.

DEATH OF THE WIDOW OF THE LATE SAMUEL CLEGG.—This venerable lady expired at the residence of her son-in-law, Queen's Crescent, Haverstock Hill, on Tuesday, the 3rd inst., in the 92nd year of her age.

ANALYSIS OF THE METROPOLITAN WATERS IN SEPTEMBER, 1865, BY PROFESSOR FRANKLAND, F.R.S., OF THE ROYAL COLLEGE OF CHEMISTRY:—

Names of Water Companies.	Solid Matter in 100,000 parts of the Waters.	Organic and other Volatile Matter.	Amount of Oxygen required for oxidation of Organic Matter.	Degrees of Hardness.		
				Permanent.	Temporary.	Total.
Thames Water Companies.						
Chelsea	24·45	1·20	·0368	5·7	12·4	18·1
West Middlesex	23·75	1·00	·0336	5·6	11·8	17·4
Southwark and Vauxhall	25·45	1·40	·0408	5·1	12·7	17·8
Grand Junction	24·50	0·95	·0352	6·0	12·1	18·1
Lambeth	25·35	1·45	·0392	5·0	13·8	18·8
Other Companies.						
Kent	39·60	2·30	·0088	7·9	17·4	25·3
New River	23·85	0·65	·0152	4·1	13·7	17·8
East London	25·70	0·90	·0272	5·3	13·7	19·0
South Essex	37·75	1·20	·0096	6·7	17·7	24·4

The table may be read thus:—100,000 lbs. of the Chelsea water contained 24·45 lbs. of solid matter, of which 1·20 lbs. of organic and other matters were driven off by incineration. ·0368 lbs. of oxygen were required to destroy organic matter in the said quantity of Chelsea water. The second column of this table contains the amount of solid matter left on evaporation and desiccation at 110°—115° C. (230°—240° F.). The results in the first three columns are recorded in 100,000 parts. By moving the decimal point one place to the right the above figures express in milligrams the quantities contained in one kilogram of the several waters. The above table contains three additional columns, showing hardness of the waters. In reference to these columns, Professor Frankland, who has succeeded Professor Hofmann at the College of Chemistry, makes the following remarks:—"Of the solid ingredients contained in potable waters, the organic and other volatile matters, entered in the third column of the above table, are generally considered to exercise the greatest and most direct influence upon the health of a community using the waters for dietetic purposes. The presence in a water of any large proportion of organic matter ought always to cause such water to be regarded with suspicion; although it is organic matter only when derived from animal sources, which is known to exercise a markedly injurious influence upon the health of consumers. The mineral ingredients contained in waters are of less direct importance in a purely sanitary point of view, but the salts of lime and magnesia, which generally constitute a very large proportion of the solid mineral matter, doubtless affect health indirectly by rendering efficient ablution and thorough cleanliness much more difficult of attainment. These salts of lime and magnesia give to the water the quality termed 'hardness.' The fifth column in the above table gives this hardness in degrees which express the number of parts of carbonate of lime (or its equivalent of other hardening salts) in 100,000 parts of water: thus a water containing one part of carbonate of lime or its equivalent in 100,000 parts is said to have one degree of hardness.* Most waters on being boiled become softer, owing to the precipitation of the carbonates of lime and magnesia. The amount of hardness lost on boiling is termed 'temporary hardness,' whilst that remaining after ebullition is designated 'permanent hardness,' the sum of both constituting the 'total hardness' of each water."

* The degree of hardness hitherto employed by chemists is that first proposed by Dr. T. Clark, viz., one grain of carbonate of lime or its equivalent in one imperial gallon of water, or one part in 70,000. The degrees of hardness used in the above table are readily converted into Clark's degrees by multiplying by 7, and then moving the decimal point one place to the left.

IMPERIAL GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Proprietors of this Company was held on Thursday, October 12th, at the Offices of the Company, 34, John Street, Bedford Row—EDWARD VAUGHAN RICHARDS, Esq., Governor, in the chair.

The SECRETARY read the notice convening the meeting; and the report and statement of accounts (of which the following is an abstract) having been previously circulated among the shareholders, were taken as read.

The directors beg leave to furnish the shareholders with the accompanying statement of the accounts of the company, and to report their proceedings during the past half year.

On the transactions of the six months there has been a net profit of £90,013. 11s. 1d. The payment of a dividend at the rate of 10 per cent. will absorb £65,000 of that sum, and the balance, less the income-tax thereon, will have to be added to the reserve-fund.

Before the expiration of the past half year, the directors made a careful examination into the company's financial position, and they arrived at the conclusion that the company's price for gas might be lowered to the extent of 6d. per 1000 cubic feet to ordinary customers. They accordingly gave notice that the rate of charge would be reduced from 4s. 6d. to 4s. per 1000 feet, from and after the 1st of July last, and they at the same time revised their scale of charge for the public lighting.

The new works undertaken, at the commencement of the present year, at the Shoreditch and Fulham stations, have been carried on satisfactorily. The substitution of one mile of 36-inch main for the same length of 22-inch, in the leading main from Fulham, has been completed.

The works of the company generally have been maintained in good order, and the directors have the satisfaction of reporting that the company will be able to meet the demand upon them for gas during the ensuing winter.

Under the authority given to them by the shareholders at the meeting in April last, to borrow £179,000 on the bonds of the company, the directors have, to the present time, raised the sum of £90,000. When the works now in hand are finished, a large portion of the remainder, which is the balance of the company's borrowing power, will have to be raised.

By the circular letter from the directors, dated the 2nd of June last, the shareholders were made acquainted with the circumstances attending the rejection of the company's bill by the House of Lords in the last session of Parliament. The continued increase in the demand for gas throughout the district which the Legislature has bound this company to supply, renders it imperative that the means of complying with that demand should be provided, and the directors believe that they will be compelled to lay the company's case again before Parliament in the ensuing session.

Dr. *Revenue Account, for the Half Year ending June 30, 1865.* *Cr.*

To Coals consumed	£104,571	17	10	By Gas-rental	£236,995	2	1
Wages for manufactory	21,387	6	10	Meter-rental	1,718	9	1
Purifying oil and sundry stores	3,378	4	3	Coke	37,748	0	0
Wear and tear	27,093	15	1	Tar	4,728	12	2
Rent, rates, and taxes	4,330	18	8	Ammoniacal liquor	1,078	7	7
Directors and auditors	1,328	15	0	Interest and sundries	656	10	11
Salaries and collectors commission	12,037	2	11				
Stationery, printing, and general charges	2,084	1	7				
Bad debts	1,127	18	5				
Law and parliamentary charges	2,689	13	0				
Compensation for damages	882	10	0				
Profit and loss	102,012	18	3				
	£282,925	1	10		£282,925	1	10

Profit and Loss Account.

To Dividend to Dec. 31, 1864	£60,213	19	0	By Balance from last account	£ 89,675	4	4
Reserve-fund	29,461	5	4	Revenue account	102,012	18	3
Contingency-fund	1,500	0	0				
Income-tax	1,073	7	2				
Interest on bonds and debentures	9,426	0	0				
Balance, being the profit for the half year	90,013	11	1				
	£191,688	2	7		£191,688	2	7

Balance-Sheet.

To Investment	£1,488,775	8	0	By Capital, joint-stock	£1,300,000	0	0
Reserve-fund invested	58,588	11	1	Proprietors 10 per cent. bonds	130,000	0	0
Contingency-fund ditto	32,434	17	6	Debenture capital	124,000	0	0
Cash for balance in hand and on deposit	67,272	7	6	Reserve-fund	58,588	11	1
Sundry debtors for gas, coke, &c.	106,126	19	10	Contingency-fund	33,934	17	6
Coals, coke, and stores for stocks on hand	29,914	10	2	Interest due on bonds and debentures	9,268	18	0
				Sundry creditors for goods, &c., supplied to company	37,306	16	5
				Profit and loss	90,013	11	1
	£1,783,112	14	1		£1,783,112	14	1

The CHAIRMAN then said: Gentlemen, with regard to our financial position, I am happy to say that we are able to pay you a dividend of 5 per cent. for the half year, and to carry over to the increment of our reserve-fund a sum of about £24,000. This will make our reserve-fund, on the 30th of June, amount in *toto* to about £80,000; but, against this, it must be borne in mind that on the 1st of July we reduced the price of our gas from 4s. 6d. per 1000 feet to 4s.—a reduction which involves a loss of income to the company of no less than £45,000 per annum. Under the provisions of the Gas Clauses Act, we are at liberty to accumulate a reserve-fund equal to one-tenth of our capital, or £130,000. That maximum we had not attained, and were therefore under no sort of legal obligation to reduce the price of our gas. On the other hand, although our bill of last session, when it came down from the Commons, contained a clause by which we agreed to reduce the price of our gas as from the 1st of July, yet when that bill was rejected by the House of Lords, with the bill fell also the provisions it contained. We were therefore under no moral obligation to reduce the price of our gas; but we felt that during the discussion which had taken place in the House of Commons a general expectation had been aroused that a reduction would take place. We also strongly felt that the probability of reduction had been, as it were, assumed throughout the discussion with those gentlemen who, before the committee of the Commons, represented large and influential parishes. Amongst others, I may mention Marylebone. Those gentlemen, although firm opponents, had treated us courteously and with good faith; and we were determined, if I may use the expression, to keep the very extreme of good faith with them, especially as we felt they were in no way responsible for the ultimate rejection of our bill by the House of Peers. We, as I have said already, strongly felt those gentlemen had conducted their opposition in the Commons in a fair, business-like manner, and in a way which entitled them to our most favourable consideration. Therefore it was we decided upon reducing the price of gas, and I believe that in so reducing the price we have not imperiled your legitimate interests. But one other subject remains—namely, the rejection of our bill on the second reading by the House of Lords. I do not think it necessary to expatiate upon that topic at any length, because you have already been put in possession of the facts by a circular which was issued very shortly after the bill was rejected. You will recollect the form in which the bill came down from the House of Commons. The principal features of it were that we were enabled to raise additional capital of £1,300,000, and to take 100 acres of land beyond those which we at present hold. Unfortunately, among the acres scheduled for buildings or for manufacturing purposes were some four acres at Fulham. The extension of works upon those four acres was supposed to affect the interests of a noble lord and a right reverend prelate, Members of the Upper House. They accordingly opposed the bill, making statements against the company which we at the time contradicted, and which I now declare we could have refuted had the opportunity been given us of going before a select committee of the House of Lords. The position we assumed in the Lords was this: we said no question of principle is here involved—it is merely a case of disputed facts. You, the House of Lords, have yourselves instituted private committees for the purpose of dissecting evidence and investigating disputed facts. Let us go before that tribunal, and we will refute the statements of our opponents, and make good our own allegations. In that position we were ably supported by the argument of a noble lord, who is well known to all of you as the Chairman of Private Bills. The result, however, was that we were not allowed to be heard before the special committee. The House was peculiarly constituted on the particular evening when our bill came on for the second reading, and the measure was lost by a majority of three. To that decision of the House of Lords, of course, we had no alternative but to submit; and far be it from me to utter one word which can possibly be considered as ungracious or discourteous towards those to whom the rejection of our bill is due. As to the future, I can only say that we shall undoubtedly consider this matter most carefully. If we shall ultimately determine to go again to Parliament, either next or in any subsequent session, the greatest possible care will be taken so to frame the bill as to conciliate the opposition of those who may consider their interests prejudicially affected by it. I heartily wish myself that we could circumscribe one district, and not supply a single light beyond those in the existing area; but we cannot do it. London continues daily to increase. The parochial authorities have the right, and they constantly exercise it, of demanding a supply of gas to the newly created districts. And the inhabitants of those districts insist upon gas in their dwelling-houses. What is to be done? Gas must be had in increased quantities, and that necessarily compels us to increase our means of manufacturing it. On behalf of the Imperial Gas Company, I distinctly disclaim any disposition to treat with indifference or contempt the opposition of those gentlemen who conceive their interests to be affected by the existence or vicinity of our works. The gas must be supplied, and it seems to me better that it should be supplied by the extension of existing works rather than that fresh works should be erected in new districts. We are placed under heavy obligations to supply the public with gas, and we must endeavour to keep pace with the demand without annoyance to the districts in which our works are situated. I have no further observations to make, and I have only to add that if any gentleman wishes to put any question to me I shall be happy to answer him. I conclude by moving—"That the report of the directors and statement of accounts, which have been read, be approved and entered on the minutes."

Mr. WATSON: I second it.

A SHAREHOLDER amused the meeting, and absorbed a good deal of valuable time, in endeavouring to explain that the terms "profit and loss" were unintelligible to him, and that any amount under such a head ought not to be on one side of the account only, but on both the debit and credit sides of the statement. The meeting, however, at last expressed themselves unwilling to hear any more, and the shareholder sat down amidst much laughter.

The resolution approving of the report and accounts was then put, and carried unanimously.

The CHAIRMAN: The next resolution is—"That a dividend of 5 per cent per share, less income-tax, be declared, and that the same be paid on and after this day."

Mr. BURKE: I second the that.

The resolution was put, and carried unanimously.

Mr. NEWTON: I would just remark, upon the payment of the income-tax, that it appears to me it is only a question whether you can or cannot do it. I merely mention it to give you the opportunity of saying whether you can pay the dividend exclusive of the income-tax.

The CHAIRMAN: I have always entertained myself the strongest possible opinion that we could not do it, but inasmuch as the question has been mooted before another gas company, they have availed themselves of the opinions, I think, of two eminent men at the bar—I will not give you the name of the particular company I am now alluding to—and they clearly held that you cannot pay the 10 per cent. and pay the income-tax besides. That is the answer that I am able to give you—that we depend on the opinions of two eminent men upon the subject; and I think it is entirely

consistent with common sense. If you pay 10 per cent. and pay the tax besides, surely you pay more than 10 per cent.

A SHAREHOLDER: Will you allow me to add a word to the question of the honourable proprietor? Is it your opinion that it is the general practice of all companies to do as you are doing, or rather is it not the exception?

The CHAIRMAN: Of course the whole question turns upon the point whether the company is limited to 10 per cent. by Act of Parliament. I am not able to say. Although I am chairman of the Imperial Gas Company, I must confess that I cannot tell you.

The honourable PROPRIETOR: I do not wish to be considered obstinate, but at the same time I think it is a matter worthy of further inquiry. It is a new question. Very many companies do it; and if it is supported and reasonable, and practically supported by a few exceptional cases among other companies, it does not by any means follow that we might not do the same thing. Who is to complain, supposing you did it? The private-individual you will say. Yes, the private individual complains. The Government has no reason, at least pecuniarily, to complain, because the Government will receive the money in one way or the other. The Government, therefore, has no practical interest in the matter. It is the private individual in society who will have to complain, and his loss will be so minute as not to be worth mentioning. I do not put this forward as an absolute opinion, but I do feel it is a matter worthy of larger inquiry, whether it is at all supported by any special exceptions.

The CHAIRMAN: It is a question of legality, and not a question of who is to take note of it. It is not a proper thing for a public company to do something which they are told is illegal, simply because there is a difficulty as to who will take notice of it. The fact is this, that under the Gas Clauses Act the Secretary of State may be put in motion before the Court of Quarter Sessions, and it seems to me, put it how you may, if you pay 10 per cent., and pay the income-tax besides, you pay more than 10 per cent.

The honourable PROPRIETOR: I do not say anything as to the illegality; I put it merely as a moot question worthy to be inquired into. The legality is to be decided by the practice of society. I say this with great respect to you and to the practice of the board generally. I have the highest opinion of the character and ability of those by whom our business is conducted, but I do think it is worthy of a more sober consideration.

The CHAIRMAN: I cannot say that we have ourselves taken a legal opinion upon the subject, but we have seen an opinion taken by another company, and that legal opinion was against our doing so, according to law. Under those circumstances I do not know what alternative we have. I believe we have now concluded the business of the meeting.

Mr. DOWNES: I beg leave to move that the best thanks of this meeting be given to the chairman and directors for their attention to the affairs of the company.

Mr. MALLETT: I second it.

The resolution was put, and carried unanimously.

The CHAIRMAN: I have only to return you our sincere thanks for the kind manner in which you are pleased to speak of us, and to assure you that as long as we have the honour to represent you we shall be ever ready to give your affairs our best attention.

SURREY CONSUMERS GAS COMPANY.

The Half-Yearly General Meeting of Shareholders was held at the London Tavern, on Thursday, Oct. 12—THOMAS POCOCK, Esq., in the chair.

The SECRETARY (Mr. Boddy) read the notice convening the meeting, the seal of the company was affixed to the register of proprietors, and the following report from the board of directors was submitted:—

The annexed statement of accounts will inform the shareholders of the operations of the company for the half year ending June 30. It will be seen that the net profit (including the balance brought forward from the previous half year) amounts to £12,094. 12s. 7d., which enables the directors to recommend a dividend of 5 per cent. for the half year upon the paid-up capital, and 1 per cent. upon the old shares on account of back dividends.

The rental for the half year amounts to £29,913. 19s. 6d.

The directors intimated in their last report that a call of £1 per share on the new shares might be made at an early date. They have deferred carrying out that intention till the progressive increase in the consumption of gas rendered it imperative upon them to extend the manufacturing and distributive power of the works; and they have now entered into a contract for a new gasholder and tank, capable of storing 800,000 cubic feet of gas. This, with the enlargement of the leading mains, will, when in operation, secure a sufficient amount of gas to meet any emergency, and will also tend to economize the cost of distribution.

To meet the outlay for the above works, a call of £1 per share on the new shares will be made during the current year, of which due notice will be given.

The directors regret to say that one of their servants, who had been so long in the service of the company as to gain the confidence of the board, has been guilty of a series of frauds, and has absconded with a considerable sum of money. The total amount of his defalcation is not yet ascertained, but it is expected that it will not exceed £1500, even should nothing be recovered through the apprehension of the defaulter.

Dr. *Balance-Sheet, to June 30, 1865.* *Cr.*

To Capital—				By Works, as per last balance-sheet		£220,672 19 9
Old shares	£150,000 0 0			Ditto, amount expended this half year	1,163 11 10	
New ditto	40,000 0 0					£221,841 11 7
	£190,000 0 0			Due to the company for		
Less calls unpaid	18 0 0			Gas		12,105 18 4
		189,982 0 0		Products		2,084 14 2
Bonds		35,000 0 0		Sundries		1,322 0 2
Sundry creditors		7,996 12 11		Coals in stock		1,305 0 0
Dividends unpaid		218 10 4		Cash balances—		
Balance of revenue account		12,094 12 7		At bankers, general account	£6,402 16 11	
				Dividend account	218 10 4	
				Petty cash	11 4 4	
						6,632 11 7
		£245,291 15 10				£245,291 15 10

Revenue Account, for the Six Months ending June 30, 1865.

RECEIPTS.			EXPENDITURE.		
Balance brought forward		£ 890 9 2	Directors allowances	£ 750 0 0	
Sale of gas—			Salaries of secretary and clerks	477 0 0	
Common gas, at 4s. 6d. per 1000 cubic feet	£23,413 9 2		Collectors commission and pay	376 8 4	
Public lighting, and under contracts	6,500 10 4		Stationery, printing, and general charges	297 6 2	
		29,913 19 6	Payment to auditors	31 10 0	
Sale of residual products—					£1,932 4 6
Coke	£4,443 6 8		Manufacture of gas—		
Breeze	218 6 0		Coals carbonized	£12,789 10 8	
Tar	1,171 11 6		Purifying materials	112 0 0	
Ammoniacal liquor	111 4 0		Supervision and labour	4,606 7 0	
		5,944 8 2	Tools and other implements	179 0 8	
Transfer fees		9 2 6	Ordinary repair and maintenance of premises and plant	1,089 11 6	
Miscellaneous receipts		50 19 3			18,776 9 10
			Distribution, including service-mains, pipes, &c.—		
			Ordinary repair and maintenance	£ 410 5 5	
			Meters, restoring and replacing	170 11 7	
			Meters, additional	160 12 8	
					741 9 8
			Rents, rates, and taxes		1,015 5 8
			Bad debts and allowances		281 12 3
			Ditto by defalcation (*ad interim*)		1,000 0 0
			Interest		893 17 1
			Law charges		73 7 9
			Balance		12,094 12 7
		£36,808 18 7			£36,808 18 7

The CHAIRMAN, in moving the adoption of the report, said that that document, with the accounts appended to it, so fully explained the position of the company, that it was not necessary for him to trespass at any length upon the attention of the meeting. It was always a satisfaction to the directors to meet the shareholders on these occasions, and to render to them an account of their stewardship during the previous six months, although for once, he was bound to confess, the pleasure was not unmingled with pain. It was pleasant to have to report that the business of the company was progressing, and that all its operations were conducted to the satisfaction of the board, under the management of their excellent engineer, Mr. Finlay; but the intelligence contained in the last paragraph of the report was, unfortunately, of a most painful character. It was very sad to think that a young man, who had been in the service of the company for twelve years, and who held a responsible position, should so far forget his obligations to his employers as to act in the dishonest way that this officer had done, and thus bring disgrace and ruin upon his wife and family. It was to be hoped that justice would overtake the delinquent, and that he would be made to pay the penalty of his sin. Referring to the affairs of the company generally, the chairman remarked that it would be seen the directors had laid out a large sum of money upon the works since they passed into their hands. That money had been expended in a very prudent manner for the substantial benefit of the undertaking, and he hoped that for many years to come it would require only a small outlay to maintain the works in their present efficient condition. The directors were now laying a very capacious main almost up to London Bridge, so as to enable them to meet the demand for gas, however large it might become. They had also entered into a contract for the construction of a new gasholder, so as to increase the storage powers of the works. He believed the shareholders would be fully compensated for all the capital which had been expended, and that they might look forward to the future of the company as one of considerable promise. He concluded by moving that the report and accounts be received and adopted.

Mr. LIDDLE seconded the motion. He said he had, as usual, made an inspection of the works, and could testify to the truth of the chairman's remark—that the money of the shareholders had been well laid out. He was persuaded that the company were now in a position to meet the utmost demands of the district, and that in future there would be no cause of complaint as to an efficient supply of gas. Unfortunately for the company, they were so situated that every addition to their rental was attended with considerable additional expense. Having the highest confidence in the discretion of the directors, and in the ability of their secretary and engineer, he anticipated that the affairs of the company would progressively improve.

A long conversation ensued, in which many shareholders and several of the directors took part, respecting the case of defalcation referred to in the report. Explanations were given as to the mode in which the frauds had been committed, and the circumstances which led to their discovery, and a variety of suggestions were offered with regard to the checks which might be adopted to prevent a recurrence of such delinquencies.

The motion was then put, and carried unanimously.

The CHAIRMAN moved—"That a dividend at the rate of 5 per cent. for the half year ending at Midsummer last be now declared upon the paid-up capital, and a further dividend of 1 per cent. upon the old shares, on account of back dividend, and that the same be payable on and after the 23rd of October instant;" which, having been seconded,

The CHAIRMAN stated, in reply to a shareholder, that an invitation had been given to a deputation from the several parishes supplied by the company to meet the directors in about a fortnight's time, to consider the question of a reduction in the price of gas, and he had no doubt a very amicable arrangement would then be come to.

A vote of thanks to the directors terminated the proceedings.

CONTINENTAL UNION GAS COMPANY, LIMITED.

The Ordinary Annual Meeting of the Shareholders of this Company was held at the London Tavern, on Monday, Oct. 9—Lewis Cubitt, Esq., in the chair.

Mr. Geo. M. Bright, the secretary, read the advertisement convening the meeting, and the report of the directors, with the accounts for the year ended June 30 last.

Your directors have much pleasure in submitting to you the accounts for the twelve months ending June 30, 1865, and are glad to be able to report favourably of the prospects of the company.

The public and private lights have steadily increased, and the respective totals have risen, the public from 8447 to 8969, and the private from 73,131 to 78,293.

Milan.—The negotiations for the renewal of the concession of Milan, which were pending at the time when this company took over the business, have since been successfully carried through, and the exclusive privilege has been secured of lighting this important Italian city for a period of 45 years, and the area over which this privilege is granted has been made to embrace the whole of the suburbs, whereas previously it extended only over the heart of the city, thus guarding the company from all possible competition.

The increase in the number of public and private lights has been already very considerable; these have risen, the public from 1738 to 2022, and the private from 20,491 to 23,281, being an advance of 16 per cent. on the public, and 13 per cent. on the private lights.

The requisite mains are now in process of being laid over the whole of the new area acquired, and this work is being pushed forward as rapidly as possible. A great number of the old wrought-iron mains in the original district have been taken up, and these streets are being relaid with cast-iron pipes, which course must tend to cause a reduction of leakage.

To meet the increased demand in this city a new double-lift gasholder, 83 feet by 29 feet, is being erected, and is now nearly completed.

All the stipulations of the new concession have been complied with, the relations with the municipality are excellent, and the future prospects of this station, as exhibited by a successive increase of consumption, seem to be assured.

At *Genoa* large works have been carried out during the present year; the old retort-house, containing 81 retorts, has been pulled down, and a new one to contain 112 is in course of erection. A new telescopic gasholder has also been erected.

Great efforts have been made to put the affairs of the company in the most favourable position, and though, from the extent of the works required both in Italy and France it has been found impossible to carry them all out in their entirety in the course of the present year, yet they are being vigilantly pushed on, and the company cannot fail to reap the benefits which will undoubtedly accrue therefrom.

Large additions and improvements have been, and are still being carried out at most of the French stations.

At *Albi* entirely new works with gasholder have been erected, and rails have been laid from the railway into the works, whereby a saving is made in the cost of carriage of coal.

At *Vienne* a new gasholder has been put up, with new purifiers, condensers, and other improvements. Three-fourths of the old mains have been taken up, and relaid by some of larger diameter of cast-iron.

At *Nismes* we have erected two new gasholders, with four new purifiers.

At *Roanne* a new gasholder is now in course of erection.

At *Cette* a new concession for 50 years has been obtained, and plans are being prepared for the erection of entirely new works on land favourably situated, which has been purchased for that purpose.

During the progress of the new works the old works will suffice for the requirements of the town.

At *Strasburg* there has been an increase of 11 per cent. in the number of public lights, and 7 per cent. in the private. The consumption is here steadily increasing.

Messina.—In the autumn of last year a proposition was made to the board for the sale to them of the gas-works of Messina. The company's engineer was sent specially to visit these works, and advise the board on their monetary value and future prospects. The result of his report was that negotiations were begun, which ended in the purchase of the said works on behalf of this company. The concession has nearly 60 years to run, and this property may be looked upon as a valuable acquisition. These works have been so lately constructed (within the last three years), that the new system of lighting has not as yet had time to develop itself; but the private lights in this city have increased during our six months tenure by 13 per cent., and the remainder of the present working year may be looked forward to as likely to add materially to the consumption of gas, the benefits of which hitherto unknown to the population, appear now to be appreciated by them.

Montargis.—The works at Montargis, a comparatively small town, distant about 45 miles from Paris, have been also added to the list of the stations of the company, and the results have justified the purchase.

It is with much gratification that the directors are able to point to the improvements which have been carried out, and which they hope will soon enable the managers to work their stations with greater profit and advantage than was previously possible.

Upon a review of the results of the working of the year, and looking to the improved prospect which must arise from the expenditure which has been incurred upon enlargements and improvements at the various stations, the directors recommend the payment of a dividend at the rate of 8 per cent. per annum, free of income-tax, leaving the sum of £5332. 1s. 8d. to be carried to profit and loss new account.

The Chairman said, by their first purchase from the Société d'Exploitation, which was now extinct, the company became possessed of thirteen stations, and by the subsequent purchases, to which reference had been made in the report, the number was increased to fifteen. Of these, six were for the supply of gas to cities in Italy, and nine for the supply of cities and towns in France. All of those cities and towns were well situated with regard to railways and canals, so that the company were enabled to maintain a rapid and regular delivery of coals to their several stations. In the manufacture of gas at the works in France they used Belgian coal, and at their Italian stations they used English coal. The affairs of the company were most satisfactorily conducted; the directors received the accounts from the different works monthly, which accounts were watched and *surveilléd* at the offices in France, and also further examined at the offices in London. At Milan, as the report had informed the proprietors, the directors had accepted a much larger concession, for the sake of securing to themselves the lighting which they already had, and the rough diagram upon the table would give them some notion of the radius of the former and of the present limits. Milan was a large and one of the most important cities of Italy; it was centrally situated, full of activity, life, and business, and was in reality the Paris of Italy. By the terms of the concessions, they were bound to keep up a good supply of coals at their various stations, and the board were careful to maintain that supply in excess of the actual requirements, so as to satisfy the authorities, and at the same time to guard themselves against the possibility of any hindrance to their operations through a sudden increase of price, or other circumstance. With reference to the results of their operations, he hoped that the dividend which the directors were able to pay the shareholders would be regarded by them as satisfactory. In the early days of a company like this, they must be aware that it was not possible to reap all the advantages to which they were entitled, because of the necessity for expending large sums of money in additions and improvements at their works; but the directors had reason to believe that the future working of the stations would yield them an ample return for the capital invested in the undertaking. With these observations, he would now move that the report and accounts be received and adopted, and would only add that he should be happy to listen to the remarks of any proprietors who desired to address the meeting.

Mr. Blake, a director, seconded the motion.

Mr. Richards suggested that the report and accounts should be printed and circulated before the annual meetings, as he felt sure that it was impossible, on the mere reading by the secretary of such a mass of figures as they had just listened to, that the proprietors could do more than obtain a very general view of the facts of the case. As far as he could himself grasp them, the accounts presented were most satisfactory, but he thought it would have been better for the proprietors if they could have had a copy of them a few days before the meeting for consideration. At the same time he begged it to be distinctly understood that in offering the suggestion he was not making the slightest reflection upon the directors for not printing the accounts, and he was quite aware that in the infancy of a concern like this there might be prudential reasons for not publishing them. If, however, the report and accounts could be published with the names of the directors appended in the way it was usually done by gas companies in the present day, it would be very gratifying. With the exception of his old friend Mr. Cubitt, in whom he possessed the greatest confidence, he did not know the names of any of the directors.

The Chairman explained that the Continental Union Gas Company was one of three companies possessing stations abroad, the others being the Imperial Continental and the European Gas Companies. These two companies had been established for many years, and they never published their reports or accounts. If this company were to do so, it was quite possible that every now and then they would find themselves prejudiced thereby. It must be remembered that they were not an English company, having English works, and compelled by Act of Parliament to lay their accounts before the public periodically. They were a foreign manufacturing company—he hoped he might say a prosperous one—but they were under no conditions to publish the results of their operations. Other companies similarly situated did not do so, and he feared that if they adopted Mr. Richards' suggestion it might be prejudicial.

Mr. Richards expressed himself perfectly satisfied with the explanation afforded.

The Chairman then put it to the meeting whether it was their wish that the accounts should be published, and it was unanimously resolved that it would not be expedient to do so.

The motion for the adoption of the report was also agreed to.

The Chairman moved—"That a dividend for the last six months be now declared, at the rate of 8 per cent., free of income-tax, payable on the 14th inst."

Mr. Fawcett, a director, seconded the motion, which was put and carried *nem. con.*

The Chairman moved the re-election of Mr. Joseph Hadland as an auditor of the company. He said Mr. Hadland had given his services to the company from the commencement of its operations, and his assistance had been most valuable. The work which the auditors had to do was almost superhuman, for the accounts in French, which were received every month, were very voluminous, and required the most assiduous attention. The auditors had earned the thanks of the proprietors for their labours, and he had much pleasure in proposing the re-election of Mr. Hadland.

Mr. Peel seconded the motion.

Mr. Brickwell asked how the auditors were appointed.

The Chairman said in the first place they were nominated by the directors, but their subsequent election was with the proprietors.

Mr. Brickwell said he made the inquiry only with the view of ascertaining that the question of remuneration was not forgotten.

The Chairman said the remuneration of the auditors rested with the board, who, however, would take into consideration any views expressed by the proprietors upon the subject, and act thereon as they thought best. On the one hand they had to guard against anything like extravagance, and on the other hand they must be careful to offer such a recompense for services rendered as would secure the work being efficiently done. When they asked a gentleman so conversant with gas accounts as Mr. Hadland, to become an auditor, they were bound to take into consideration his position, and the amount of time and ability he gave to the interests of the company.

The motion was then put, and cordially adopted.

The Chairman proposed the re-election of Mr. Henry M'Lauchlan Backler as an auditor. Mr. Backler had been associated with the company from its commencement; he worked very hard, was a most able and efficient man, a thorough Englishman and a thorough Frenchman, and as familiar with gas accounts as with the four-and-twenty hours of the day.

Mr. Lewis seconded the motion with great pleasure, having witnessed Mr. Backler's ability and energy in connexion with another company for many years past, and he was persuaded they could not have a better man as an auditor.

This motion also was adopted most cordially.

Mr. Richards said the chairman, in the course of his observations, stated that at some of the stations they used Belgian and at others English coal. He wished to know whether the chairman could give him any idea as to the comparative illuminating power of the two coals.

The Chairman said if he were at the office he could answer the question definitely, as they constantly had analyses of the two descriptions, but at the present moment the facts were not at his fingers ends.

Mr. Fawcett said the comparison was very much in favour of English coal.

Mr. White, another director, said the difference was so great that they would never use Belgian or French coal if they could get English. It was only the question of the expense of carriage which prevented them from entirely using the latter.

The Chairman said Mr. White's opinion was worth much more than his own on such a question. Mr. White was a director of the European Gas Company, which possessed a number of stations where they used English coal entirely.

Mr. White said they had never yet been able to use any other coal with equal advantage.

Mr. Hadland returned thanks for himself and Mr. Backler on their re-election, and said he considered himself extremely fortunate in having such a colleague as Mr. Backler. Indeed, that gentleman was so conversant with accounts of this nature, particularly such as related to foreign works, that he was relieved from much anxiety in the performance of his duties. But for the assistance of Mr. Backler he should hardly have ventured to continue in office.

Mr. Richards moved a vote of thanks to the chairman and directors for their able management of the company's affairs, which, having been seconded, was carried by acclamation.

The Chairman briefly acknowledged the vote, and the proceedings terminated.

ALLIANCE AND CONSUMERS GAS COMPANY (DUBLIN).

The usual Half-Yearly General Meeting of this Company took place on Saturday, the 30th ult., at their Office, 114, Grafton Street, for the purpose of receiving the report of the directors and statement of accounts for the half year ending the 30th of June last, and to sanction the payment of a dividend thereon—T. M. GRESHAM, Esq., in the chair.

Mr. STEVENSON, the secretary, having read the advertisement calling the meeting, read the following report:—

The directors, in submitting the accounts for the half year ending the 30th of June last, to the proprietors, have again to congratulate them on the steady increase of the company's business. They regret, however, to state that a combination of circumstances, including the reduction in the price of gas, which came into operation on the 1st of January, the increase in the cost of coal and the falling off in the demand for coke, have led to a slight diminution of the net profit, as compared with that of the preceding half year. For such a result, however, the proprietors, as well as the board, were prepared; but the directors have every reason to assume that an increase of new business during the current half year will more than compensate and counterbalance the falling off to which the board have adverted.

During the past six months the directors have devoted a good deal of attention to the probable requirements of the future; and they have, accordingly, to report that in anticipation of a largely increased demand for gas, they have entered into contracts for another large telescopic gasholder, and other important works, including a set of dry lime, or oxide of iron purifyers, and an additional 24-inch main from the station to Carlisle Bridge. These extensions, with the introduction of some additional mains into new districts, and the substitution of large for small pipes in other localities, will add considerably to the capabilities of the works, and enable the board to economize the cost of distribution in the decrease of leakage, and thereby largely contribute to the profitable working of the undertaking.

The board have great pleasure in assuring the proprietors that everything in and about the station is in most excellent condition, and complete working order. A new and powerful scrubber has been put into action within the last few weeks, and other means and appliances are being adopted with the view not only of thoroughly purifying the gas and freeing it from all deleterious compounds, but of rendering the secondary products still more contributory to the increase of rental and profits.

Within the last few weeks the corporation of Dublin advertised for tenders for the supply of gas to the city lamps, and the board—conscious of their obligations to the citizens, and in deference to the expressed desire of the municipality—considered themselves bound to offer to undertake the service, and it was accordingly resolved at a special meeting of the directors, to tender for the lighting for a period of ten years, agreeably with the specifications set forth by the corporation, on terms which could scarcely fail to be regarded as highly advantageous to the public. The committee of the corporation having charge of the city lighting having, however, considered it advisable to seek other tenders, providing for and fixing a higher standard of illuminating power, namely, 20-candle gas, and the board being perfectly satisfied that gas of that quality could not be profitably or conveniently manufactured in Dublin, have declined to tender under the new specification, and so the matter remains for the present.

The board consider it their duty frankly to intimate to the proprietors that for some time past they have had under consideration the propriety of seeking for additional parliamentary powers in respect both to capital and territory. At present the operations of the company are restricted to the metropolitan police district of the city of Dublin; and as many of the suburban districts—from which the company are at present virtually excluded—are rapidly rising into importance and increasing in population, the board are unanimously of opinion that it would be prudent and desirable to obtain parliamentary sanction and authority to extend, on fitting opportunities, the mains of the company, where such extensions can be made auxiliary to the interests of the proprietors and the accommodation of the public. Such being the conviction of the board, they have instructed the company's solicitor to prepare the necessary notices for an amendment of the company's Act of Incorporation, and at the same time, take such steps as may be necessary to uphold and protect their interests in other respects, so far as these are likely to be affected or jeopardized by the claims of rival undertakings.

The board have now only to direct the attention of the meeting to the accounts just read, and especially to the profit and loss account, exhibiting a net profit on the operations of the half year to the amount of £6409. 15s. 2d., which, as usual, has been added to the account applicable to dividend; from which they recommend the payment of a dividend at the rate of 7s. per share, free of income-tax.

The CHAIRMAN, in moving the adoption of the report, said it had gone so much into the details of the company's affairs that it was scarcely necessary for him to enter into any further explanation. But there was something concerning the present half-yearly meeting of which he would say a few words. He thought it right to say that the report told them that they had not exactly the same sum to put to their credit this half year as they had before. It was true they had the dividend, but, as every housekeeper must know, a great increase in the price of coals now existed, to what it was last year, which made a difference to the company alone of £600 for the half year. He was sorry to tell them that during the past week they had got notice of an increase in the price 2s. 6d. per ton upon cannel coal, and there was no knowing where the price of that coal would stop. They were asked to do things which would not be consistent with the trust reposed in them. It was impossible to comply with all the applications that had been made to them. They were anxious, as far as in their power, not only to support the character of the company, but, if possible, increase the confidence of the public, and what was more, to show how anxious the directors were to promote the interests of the shareholders. When they commenced the company, which was not so many years ago, the public were paying 10s. per 1000 feet for gas to them, and he happened to be one of the directors at that time, therefore he could speak clearly on the matter. He thought it his duty to bring before them the different movements they had made during that time. They were able to take advantage of every scientific improvement brought to bear in the making of gas, and in the nature of the disposal of their coke and ammoniacal liquor, and other matters connected with their works, which had enabled them to reduce their gas from time to time. From 10s. they reduced it to 7s. 6d.; from 7s. 6d. to 6s. 8d.; from 6s. 8d. to 5s. 10d.; then to 4s. 9d.; and on the 1st of January last to 4s. 6d. They had, he trusted, shown the public that they were worthy of support. They had not paid an extravagant dividend, for although it appeared to be something like 7 per cent. it was very little when consideration was given to the risk all gas companies must run. They had given the public every benefit they could give them, only reserving what would bring a moderate dividend. If coals increased, as he hoped they would not—and he saw and heard nothing that was likely to make the price of coals decrease—the shareholders should do all in their power to recommend a company which had done so much for the city of Dublin. They had reduced the price of gas from 10s. to 4s. 6d., and the gas at present supplied was just as good as that which had been supplied at the higher rate, while equal attention had been paid to the interests of their customers. They had been enabled to make this great reduction in price owing to their adoption of scientific improvements, which resulted in a very large addition to their receipts. Their clay retorts now lasted three times as long as their iron ones did before. They had not run a risk without some little interruption. It appeared that some persons had thought that they ought to compete with them, and contend for the mastery. They had heard of the Commercial Gas Company. He did not say it was unfair for any one to come into the market with a commodity, and compete with other persons in the commercial world, but he thought there was not room in Dublin for the operation of a third gas company. He hoped they would not blame him if he told them that they could not continue to pay the dividend the shareholders were then receiving if a third company came into the field. In London, Liverpool, and other places, there were gas companies doing twenty times as much business as they were doing. They would be able to do as much if they had call for it. The report told them that they had sent in a tender to the corporation in accordance with the specification, but he could not then advert to the result of that. They had for two reasons sent in that tender, not because they wished to interfere unfairly with the Hibernian Gas Company, but they felt that during last session a wrong impression was made on the public mind to the effect that they were not willing to light the public lamps because they were in the hands of another company. They had now proved that they were willing, and they had complied in every way with the specifications of the corporation. They had shown they were not connected with any other company, and that they (the directors) had looked only to the interests of the shareholders. He thought it right to say that they had put the company in a position before the public, and before the Government, such as will next session refute the allegation that they would not put in a tender to the corporation. They should do the best for the future, but as regarded supply, the illuminating gas required by the corporation they were not able to send in a tender for it, because they knew that it would be impossible for that company, or for any other company in the city, to supply that light and to allow a fair remuneration to the shareholders. He was sure as long as the shareholders did them the honour of making them their trustees they would not be asked to do so. Mr. Stevenson, who was at Parliament last session would, he hoped, be there next session for the purpose of showing that they should have a larger extent of territory, or line, than the metropolitan police borough. The suburbs of Dublin, for a long way round, had become, if not towns, certainly very large villages, and it would be of importance to have their operations extended to them. Their solicitor, who was in the room, had been very properly entrusted with the conduct of their parliamentary business. He would, no doubt, be kind enough to tell them something more than he (the chairman) did. The last reduction which they had made amounted to a difference to the company of £2000, and he believed that was too great a stretch, but he hoped they should get more business, and in that manner be compensated. Their works were capable of supplying the whole city. Their expenses were going on, and the more business they got the greater would be their dividends. They should be able to do half as much more business on very little more expense. Their works were never in better order than at present. One of their largest shareholders, an English gentleman, went with him (the chairman) through the company's works, and after a personal inspection that gentleman said he never saw gas-works in such perfect order. He had never seen them before, and he was pleased and delighted with them. In conclusion, the chairman said he had only to say, that the shareholders should not for a moment think that the company could give gas at a price less than that at which they at present supplied it. They had the authority of Mr. Barlow, one of the first gas engineers in England, for saying that their works could not be improved. They should get as much business as they could, and they might rely on it that the directors would give every moment of their time to the protection of the interests of the shareholders, and that any contracts they might enter into should have their best consideration.

Mr. J. M. CANTWELL seconded the adoption of the report. He said he might congratulate them on the net profits made during the half year; and although there was a very trifling diminution in that amount as compared with that of the previous six months, still there were circumstances connected with the company which would constitute grounds for real satisfaction. He referred to an assertion which had spread among the public in a manner that gave it the assumption almost of truth—that this company and the Hibernian Gas Company were in close combination; and that though there had existed two companies, yet in fact there was only one. That combination was alleged, and unfairly and unjustly alleged, to have existed between the two companies, and he wished to give that allegation a deliberate and circumstantial refutation, as the company had recently sent in a tender to the corporation for the public lighting of Dublin, which, upon investigation at a future day, would prove to have been an honest and excellent tender, and as good for both purchaser and seller as could have been devised. Having discussed this subject at length, he next referred to the illuminating power of gas required by the specification of the corporation, and in an able manner contended that gas of 20-candle power could not be supplied by any company with advantage to the shareholders. He referred to the evidence of Mr. Barlow, the eminent engineer, at the last session of Parliament, with respect to this very much vexed question, which was of as much importance to the public as to the shareholders. Upon that occasion Mr. Barlow, a first-class authority upon such a subject—and if he was wrong at the time, there were twenty witnesses present to contradict him—Mr. Barlow stated that 20-candle gas could only be produced from one description of coal, called cannel coal. The deposits of cannel coal, upon Mr. Barlow's authority, were very limited. There was an extensive one at Wigan, and two or three in Scotland, of less importance; therefore, after a short time, the supply would be exhausted. In dealing with the probable increase in the price as the supply became more limited, he said that Boghead, the best and richest description of cannel coal, in 1851 was only 16s. per ton, while at present it was 45s. Another important item to be considered by the public would be the cost they should incur by burning gas of 20-candle power, by the change of fixtures and constant attendance upon peculiar burners, in order to have the full benefit of the gas.

Mr. DARCY said the price of Boghead cannel coal is at present 50s. per ton.

The CHAIRMAN then moved that a dividend of 7s. per share, free of income-tax, be paid, which was carried.

Mr. DARCY moved a vote of thanks to the directors for the care they had bestowed on the company's affairs. He thought they acted in the very best manner by refusing the second tender of the corporation.

Mr. KENNY seconded the motion, which passed unanimously.

The CHAIRMAN said he was sure the directors felt particularly obliged to Mr. Darcy and the gentlemen present, but with regard to the impression of 20-candle gas, he should say it did not belong to them.

Alderman Moylan was then moved to the second chair.

Mr. TALLON moved a vote of thanks to the chairman, Mr. Gresham, for his dignified conduct in the chair, which was seconded by Mr. DARCY.

Mr. GRESHAM returned thanks.

Mr. DARCY then proposed, and Mr. LANE seconded, a vote of thanks to their efficient secretary and able engineer, after which the meeting separated.

SHEPPY GAS CONSUMERS COMPANY, LIMITED.

The Half-Yearly Ordinary General Meeting of the above Company was held at the Britannia Inn, Mile Town, on Tuesday, the 3rd inst., when, a large number of the shareholders were present Mr. CHARLES ALLEN having been unanimously elected chairman, and the secretary having read the notice calling the meeting, the business of the evening was commenced by the secretary reading the minutes of the last meeting, which were then confirmed.

The SECRETARY next read the following report:—

The business of the current half year enables the directors to report the entirely satisfactory position of the company. The reduction in the price of gas has diminished the divisible profit on the working of the half year, rather more than 1 per cent. upon the ordinary share capital, but this has in a measure been met by an encouraging increase of business. The directors believe that this policy of sharing the results of success with the gas consumers themselves is a sound one, and that it will not only tend to promote public confidence, and consolidate the stability of the undertaking, but ultimately lead to a yet more extended use of gas.

During the half year the directors thought it desirable, before carrying out the contemplated extensions and alterations in the works, to take the advice of T. G. Barlow, Esq., the eminent gas engineer, who was requested to visit the works, and report upon their general efficiency. The directors, during Mr. Barlow's visit, embraced the opportunity of consulting with that gentlemen upon the financial affairs of the company, and the arrangement of the ordinary accounts. Having received the report of Mr. Barlow, it affords the directors sincere satisfaction to state that the principles of the past management of the business of the company received his entire approval. In accordance with the advice thus obtained, arrangements have been made for increasing the number of retorts, and replacing the present small purifiers by others of a more adequate size. By means of these alterations and additions it is believed that considerable economy will be effected in the manufacturing processes. A satisfactory arrangement has been entered into with the mortgagee for the periodical reduction of his loan, by the payment of a yearly instalment of £400.

The recent proposal to increase the borrowed capital of the company has not been acted upon, it having been deemed advisable, upon mature consideration, to recommend in lieu of this plan, an increase of the share capital. A special resolution for effecting this object will be submitted to the shareholders present, after the ordinary general meeting now convened. Should this measure receive the sanction of the shareholders, it is proposed to issue a sufficient number of shares (not more than 800) at a minimum premium of £1 per share, to repay the temporary loans, to cover the cost of the recent extensions, with those now in progress, and to provide for the annual payment in reduction of the mortgage-loan.

The amount of divisible profits at disposal enables the directors to recommend the declaration of the following dividends—viz., a dividend after the rate of 2s. per share for the half year, upon the 4 per cent preference shares; a dividend after the rate of 2s. 6d. per share for the half year upon the 5 per cent preference shares; a dividend after the rate of 5s. per share for the half year, or 10 per cent. per annum, upon the ordinary share capital. Such dividends to be payable on or after the 1st day of November next, at the office of the company. The sum required for the payment of these dividends will be £627. 15s., leaving a balance to be carried forward of £30. 12s. 11d.

The directors submit that, in the present position of the undertaking, the question of fixing a definite sum as a remuneration for the time devoted by them to the business of the company, may be fairly considered.

The directors regret to have to record the decease of Mr. Thomas W. Coke, a director of the company. The vacancy in the board thus caused has been filled by the election of Mr. Alfred Filmer, as a director.

The CHAIRMAN having moved the adoption of the report,

Mr. A. JACOBS (a shareholder) said he trusted that before the shareholders gave their sanction to the report, they would give it their fullest and most deliberate attention, and that they would not be led away by the remarks made by any individual who might feel an interest in upholding the present directors, who had thought proper to place before them a report which would puzzle the most eminent lawyer in England; and he need not say that it was above his or any shareholder's comprehension. He trusted they would not be influenced by the directors doing as they had done for two or three years, namely, giving a dividend of 10 per cent., for he was assured it was more than they could afford; and what did they want to do now? To put them to a debt of nearly £10,000. If any man was in business, would he carry it on in that reckless way? In the trade account, the gas-rental and meter hire amounted to £2350. 12s. 4d.; and on the other side, in the statement of income and expenditure, they gave them the amount of £3128. 3s. 8d.; consequently there was a deficiency of nearly £800. He thought the shareholders should know what had been done with that amount, for he had gone through the report several times and could not make anything of it. Then, in the trade account, the coke, tar, &c., sold was fixed at £550. 0s. 11d., and in the statement of income it was stated to be £574. 1s.; therefore there was a deficiency of £24. The secretary's commission, on one side, was stated to be £94. 17s. 2d., and on the other side, £115. 11s. 7d. Again, for gas-fittings sold in the past half year, the amount was stated to be £24. 3s. 2d., and on the other side, £55. 0s. 7d.—a deficiency of £31. Now, it was not that he doubted its correctness, but he thought they ought to have a more accurate and plain statement of the company's affairs, and not allow themselves to be plunged head over ears in debt, and to have the company thrown into Chancery, where it must go at length. He then inquired where the interest was to come from, and concluded by expressing his determination to oppose the adoption of the report, and move an amendment to that effect, if the discrepancies he had alluded to were not satisfactorily explained.

The SECRETARY said the company were compelled to show a statement of the income and expenditure precisely in the form in which it was given, and also a balance-sheet made up to the end of the year, or the period for which the accounts stood; but whether the directors showed any more accounts or not was optional with themselves. It was thought they might be more easily understood if the directors gave an abstract of the accounts, and put them in such a form that the position of the company could be perceived at a glance. That was what was done now; and the discrepancies pointed out by Mr. Jacobs were necessary. He must understand that they showed there £3128. 3s. 8d. received for gas; but it should be borne in mind that at the end of the previous half year £1650. 17s. 1d. was due for gas, belonging to a previous half year, which they had subsequently received; therefore they showed that in their income, and also what they received for the last quarter. On the last day of the half year the accounts were due, and were, therefore, shown thus in the balance-sheet.

Mr. JACOBS still expressed his dissatisfaction at the report, and moved, as an amendment, that it be refused.

Mr. CROCKFORD said the matter appeared very plain to him. In the statement of income and expenditure the gas-rental and meter hire was stated to be £3202. 15s. 4d., less £74. 11s. 8d. discount, and below the line they found the amount of actual income given as £3128. 1s. 8d. In the trade account the amount was stated to be £2350. 12s. 4d.; that was not the money received, but the gas sold.

Mr. JACOBS said it was a bad plan of keeping accounts; and

The SECRETARY informed him that if he had called at the office, and raised any objections to the accounts, he would have gone through the books, and explained the whole of the matters alluded to.

Mr. GORDON having made a few observations, in which he stated his satisaction at the manner in which the accounts were shown,

Mr. J. COLE seconded the adoption of the report, which was carried, the amendment not meeting with a seconder.

Mr. FILMER then proposed that the following dividends be and are hereby declared:—A dividend of 2s. per share for the half year upon the 4 per cent. preference shares, 2s. 6d. upon the 5 per cent. preference, and 5s. upon the ordinary share capital.

Mr. DIBBS (of London) seconded the proposition, which was carried.

On the proposition of Mr. TODHUNTER, seconded by Mr. MURTON, it was resolved—"That the sum of £25 per half year be allowed the directors for the management of the company's affairs, to be divided among them in proportion to the meetings they attend."

Mr. COLE then moved "that the 24th Article of Association, defining the amount of capital of the company, be varied and amended by the substitution of the words "Twenty-five thousand pounds" for "Fifteen thousand pounds," which was seconded by Mr. HARE, and carried.

On the proposition of Mr. FILMER, seconded by Mr. BARNABY, it was resolved—"That the directors be and are hereby empowered to further increase the capital of this company by the creation and issue of 2000 shares of £5 each.

A vote of thanks to the chairman terminated the proceedings.

METROPOLITAN BOARD OF WORKS.

At the usual Meeting of the Board, on Friday, Oct. 13—Sir JOHN THWAITES in the chair,

The CLERK read the following report from the Main Drainage Committee, to whom the carrying out of the provisions of the Sales of Gas Act in the metropolis is confided:—

Your committee have to report that they have received an application from Mr. Cresy, the principal assistant-clerk, requesting a consideration of his services in the preparation of plans and specifications, and the supervision of the construction of three gas-meter testing-houses in Spitalfields, Westminster, and Southwark.

It will be in the recollection of your honourable board that in the autumn of 1861 it was referred to a committee to carry out the provisions of the Sales of Gas Act. It appears from the minutes of the proceedings of that committee, that on the 16th of October of that year they passed the following resolution—"That as the carrying out of the provisions of the Sales of Gas Act would materially interfere with the time of Mr. Vulliamy, so urgently required in his own department and in carrying out the new street improvements, this committee requests for the future that Mr. Cresy should attend their meetings and assist them in discharging such duties as are now performed by Mr. Vulliamy in respect thereto." Since that time Mr. Cresy has had the general superintendence of the machinery for carrying those Acts into effect. When it became desirable to abandon the temporary premises used for the purpose and to erect permanent testing-houses, the duty of preparing the plans and specifications for the same, and of superintending the erection of the buildings, was cast upon Mr. Cresy. The cost of these works amounted altogether to about £6000. The Southwark testing-house was completed in July, 1862; that in Spitalfields in February, 1863; and that in St. Ann's Street, Westminster, in January, 1865. The whole of the labour in connexion with these buildings—viz., the negotiations for the sites, the preparation of the plans and specifications, the superintendence of them while in course of erection, and the settlement of the accounts, has devolved upon Mr. Cresy; and your committee have learned, through the chairman of the board, that this work has been principally performed by him after the usual office hours.

Your committee, having taken the circumstances into consideration, recommend your honourable board to award to Mr. Cresy the sum of £105 as a special remuneration for the services rendered.

Mr. FREEMAN moved the adoption of the report, and the payment of the gratuity recommended to Mr. Cresy. He said the services rendered by Mr. Cresy prevented the necessity for employing another architect, and as the principal portion of the work done by him was done after business hours, he thought the proposed remuneration was not excessive.

Mr. PECKETT seconded the motion.

Mr. BROOKER said he should have objected to the motion but for the intimation of the chairman that the work was done in overtime, as it struck him that it was a little job for Mr. Cresy, who had not much to attend to.

Mr. S. TAYLOR objected altogether to this mode of remunerating an officer. If he were entitled to something extra for his services, let him have an addition made to salary. It was not right to deal with the ratepayers money in this way.

The CHAIRMAN said the mode of remunerating the officer was a question for the committee, and they had recommended a gratuity as being more likely to be satisfactory to the board.

Mr. HELEY also objected to the proposition. He said the whole question of the officers duties and salaries was gone into and settled more than two years ago. What was then considered right and proper was done, and it was distinctly understood that no gratuities would be asked for in any way whatever.

The CHAIRMAN said this was a special case. At the time Mr. Cresy undertook the duties, Mr. Vulliamy was so pressed with work in connexion with the new streets that it would have been necessary to employ another architect but for the services which he rendered.

Mr. HELEY said there was no necessity for Mr. Vulliamy to have anything to do with it. Anybody in the office could have done what Mr. Cresy did, and they had no right to ask an officer to work after business hours. If this application were agreed to there would soon be others of a similar kind.

After some further conversation the motion was put, and agreed to by a considerable majority.

THE BLACKMAN STREET SEWER ACCIDENT.

Mr. BAZALGETTE brought up the following report hereon:—

I submit herewith Dr. Henry Letheby's report of the result of his examination of the sample of sewage taken from the main sewer in Blackman Street, Borough, shortly after the late accident, and I recommend that the solicitor of the Board be instructed to serve a notice upon the Aërated Bread Company, requiring them at once to desist from discharging their manufacturing refuse into the sewer.

J. W. BAZALGETTE, Engineer.

"*College Laboratory, London Hospital, Oct. 9, 1865.*

"Dear Sir,—In accordance with your request, I have to report to you for the information of the Metropolitan Board of Works, the results of the examination of the sewage from the main sewer in Blackman Street, Borough, where an accident occurred on the 14th ultimo, to three of the men engaged in flushing the sewer.

"The material was sent to me on the second instant, and it was contained in a quart wine bottle. It was giving off abundance of sulphuretted hydrogen and carbonic acid; and, on analysis, I found it consisted of carbonate of lime in the form of chalk or whiting and sulphate of lime, mixed with the usual black deposit of sewage. The composition of it was the same as that which I examined in June last from a sewer in Beech Lane, Barbican, into which the refuse from one of the establishments of the Aërated Bread Company was discharged. I may state also that in that case, as in the present, the quantity of foul air evolved into the atmosphere of the sewer was so great as to be dangerous to human life; in fact, the workmen were afraid to enter the sewer, and it was a subject of complaint by the engineer of the Commissioners of Sewers. I was requested to inquire into it.

"I found that the Aërated Bread Company were in the habit of employing a mixture of whiting and oil of vitriol for the generation of carbonic acid used in the vesiculation of the bread, and that when this mixture had ceased to evolve the gas in sufficient quantity for their purpose, it was discharged into the sewer, where it continued to give off carbonic acid in such volume as to render the atmosphere unwholesome. About half a ton of this refuse was let into the sewer at a time, and I have reason to believe that it was not only evolving carbonic acid, but it was also, from its acid nature, causing the escape of sulphuretted hydrogen from the sewer mud. Judging, therefore, from this analogy, I have no doubt that the material found in the main sewer in Blackman Street has had a similar origin—namely, in the neighbouring bakery of the Aërated Bread Company, and that the foul air which was so nearly fatal to the workmen was the carbonic acid evolved from the material.

"As to the remedy for the danger which arises from the discharge of such matters into the sewers I am not able to offer much advice, except by pointing out the necessity for the adoption of some means whereby the discharge of noxious matters into the public sewers may be regulated, if not entirely stopped.

"The records of the fatal accidents in the sewers of this metropolis show how, under ordinary circumstances, by the natural processes of decomposition, the sewage may evolve sufficient carbonic acid and sulphuretted hydrogen to be dangerous to human life; but when, as in the present instance, the proportions of these gases is largely increased by the chemical action of manufacturing refuse the danger may be serious. Experiment has proved that air with less than 10 per cent. of carbonic acid, or with only from 1 to 2 per cent. of sulphuretted hydrogen, may be immediately fatal to animal life; and although these proportions do not often exist in the atmosphere of the metropolitan sewers, yet they may be easily generated by the action of acid refuse upon the sewer mud. There is, indeed, a remarkable instance of this in the accident which occurred in the Fleet Lane sewer in the month of February, 1861, when four men were instantly killed. The gas which destroyed them was sulphuretted hydrogen, and I have no doubt it was produced by the chemical action of acid refuse, from a neighbouring factory, upon the mud of the sewer in which they were working. Other cases have also come under my notice, where more or less mischief has arisen from like causes; and, considering the importance of the subject, I am of opinion that certain restrictions should be placed on the discharge of manufacturing refuse into the public sewers.—I remain, &c.,

"HENRY LETHEBY.

"J. W. Bazalgette, Esq."

The recommendation of the engineer was agreed to.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF SEPTEMBER, 1865:—

Maximum light estimated by sperm candles according to the Act	15·5
Minimum light—sperm candles	12·5
Average light—sperm candles	13·7
Traces of ammonia, indicated by turmeric test-paper	Always.
Traces of sulphuretted hydrogen, indicated by lead test-paper	None.

There has been no cause of complaint as regards the illuminating power of the gas during September; it has varied from 12·5 to 15·5 candles; ammonia is still found in excess; it has been free from sulphuretted hydrogen, and it contained when examined for sulphur a little less than 20 grains in 100 cubic feet.

SALE OF SPANISH GAS-WORKS.—The six gas-works of Valladolid, Xeres, Alicante, Carthagena, Burgos, and Pampeluna, belonging to the General Credit Company of Spain, which have for some months past been offered for sale, have, it is reported, been at length bought by a Dutch company, formed by Messrs. Polak, bankers, of the Hague, and Mr. Slokevis, a merchant of Rotterdam, supported by the Bank of Antwerp, which is charged with the emission of the shares of the company.

EXPLOSION OF GAS IN ST. GEORGE'S-IN-THE-EAST.—An explosion of gas took place on Friday morning last in the vestry-clerk's private office, in the Vestry Hall of St. George's-in-the-East, Back Road, and adjoining the large centenary chapel of the Wesleyan Methodists. At an early hour the niece of Mr. Lee, the hall-keeper, who slept at the top of the building, called her uncle's attention to an escape of gas. He lighted a match, and went into the vestry-clerk's office, which he had no sooner entered than the explosion took place. Mr. Lee and his niece, who was behind him, were thrown down, and the window of plate-glass was blown out into the yard. The room was a wreck in one instant, part of the ceiling came down, the door and doorposts were shattered, and two large sheets of plate-glass, each an inch and a half thick, were forced out of the folding-doors in the entrance hall and broken into small fragments. A window at the top of the building also fell out from

Share List of Metropolitan Gas Companies.

No. of Shares Issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano	10 0 0	10 0 0	10 to 12
5000	20	Bahia (Limited)	20 0 0	£5 intr.	17 to 17½
1000	20	Do., preference	20 0 0	10 0 0	28 0 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 to 13
20000	5	Bombay (Limited)	5 0 0	£5 intr.	5⅜ to 5½
10000	5	Do., second issue	5 0 0	£5 intr.	5 5 0
10000	5	Do., third issue	2 0 0	£5 intr.	2¼ to 2½
5000	20	Brit. Provincial L.	20 0 0	7 10 0	29½ to 30½
8200	20	Do., new (Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)	20 0 0	7 0 0	27 to 27½
12000	50	*Chartered*	50 0 0	10 0 0	76 to 78
6000	50	Do.	30 0 0	10 0 0	45½ to 46
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	30½ to 30¾
10000	10	Do., B shares	10 0 0	4 0 0	7 5 0
8000	10	Do., new shares	10 0 0	10 0 0	15 to 16
35000	25	City of Moscow (L)	5 0 0	£7 intr.	3¼ to 4
17490	25	Colonial & General *Commercial*	25 0 0	10 0 0	43 to 45
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union	20 0 0	8 0 0	18 0 0
17500	20	Do.	10 0 0	8 0 0	10¼ to 10½
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	17 to 17½
5000	10	Do., preference	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	81 to 83
4000	25	Do., new shares	21 0 0	10 0 0	36 to 37
23406	10	European (Lim.)	10 0 0	10 0 0	13¼ to 13⅞
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6¼ to 7
20000	10	*Great Central Gas Consumers*	10 0 0	10 0 0	16½ to 16¾
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	81¼ to 82
1300	100	Do., bonds	£100	10 0 0	197 to 198
7000	25	Imperial Austrian	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	92½ to 93½
3000	40	*Independent*	40 0 0	10 0 0	65 to 70
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6386	50	*London*	50 0 0	10 0 0	78½ to 79
5519	25	Do., 1st pref.	25 0 0	6 0 0	29 to 30
568	50	Do., 2nd pref.	50 0 0	6 0 0	
219	50	Do., 3rd pref.	50 0 0	6 0 0	
18731 *l*		Do., 1st pref. sh		6 0 0	
11828 *l*		Do., 2nd pref. sh		5 0 0	
1200	5	Malta & Medit. (L.)	5 0 0	2 10 0	
12000	5	Do., new shares	5 0 0	8 0 0	5⅛ to 5⅞
30000	5	Oriental, Calcutta	5 0 0	8 0 0	0 12 6
30000	5	Do., new shares	0 10 0	8 0 0	
10000	5	Ottoman (Limited)	5 0 0		3⅜ to 4½
10060	10	Pará (Limited)	10 0 0	£5 intr.	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 to 34
3660	100	Do., new	10 0 0	7 10 0	14 to 16
144000	Sk.	Do. (capit. profits)		5 0 0	
5000	20	*Ratcliff*	20 0 0	10 0 0	32 to 34
	20	Rio de Janciro (L)	20 0 0		20 to 20¼
4138	5	Singapore (Lim.)	5 0 0		
2000	5	Do., preference	5 0 0	7 10 0	
		Shanghai			
4000	50	*Sth. Metropolitan*	50 0 0	10 0 0	81 to 83
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15¾ to 16
10000	10	Do., new	4 0 0	10 0 0	7 10 0
9000	50	United General (Dublin & Limerick)	50 0 0	4 12 0	32 to 34
10000	10	*Victoria Docks*			
1500	10	*Wandsworth & Putney*	10 0 0	7 10 0	
1500	10	Do., new shares		7 10 0	
20000	10	Western (Limited)			
		A shares	10 0 0	10 0 0	16¾ to 16¾
10000	10	Do., B shares	5 0 0	10 0 0	9 to 9¼
10000	10	Do., C shares	3 0 0	10 0 0	6 to 6¾
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.)	10 0 0	6 0 0	
520	10	Do., preference	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 17 6	2 17 0	2 15 0	3 5 0	3 15 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 3-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

Brancepeth, Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Pelton, South Peareth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel:—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Mylcs' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	6s. 9d
Cork	9s. 6d. to 10 0
Dover, Folkestone, and Ramsgate	6 9
Dublin	10s. 6d. to 10 6
Exeter Quay	9 6
Ipswich	6 3
London (from Leith)	8 6
London (Pool)	6s. 9d. to 7 0
Lowestoft and Yarmouth	5 0
Portsmouth and Southampton	9 0
Plymouth	8s. 9d. to 9 9
Shoreham	8 0
Whitstable	7 6
Weymouth	9 0

Foreign.—Per Keel:—

Barcelona	24 10
Bordeaux	£15. to 15 10
Boulogne and Calais	9 10
Cadiz	17 0
Copenhagen	£9. to 10 0
Genoa	23 0
Hamburg	£10 to 10 10
Havre de Grace	11 5
Leghorn	23 0
Lisbon	16 15
Rotterdam	9 10
Stettin	10 10
Trieste	21 0
Venice	24 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000	2 15 6
Ingham's ditto (at Wortley), p. 1000	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	85 0 0
English Pig Lead, p. ton	20 10 0
Welsh Bar Iron (in London), p. ton	7 15 0
Foreign Spelter, p. ton	21 10 0
English Block Tin, p. ton	92 0 0
Banca, p. ton	92 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

the concussion. Mr. Lee's clothes were on fire when he was raised from the floor of the room. Part of his dress was completely destroyed, and his hands, face, and neck were severely burnt. He was carried to his bed, and Mr. Rygate, M.B., of Cannon Street Road, who was called in to attend him, stated last evening that his patient was going on favourably. Mr. Lee's niece was also scorched on the right hand and the back of her head. It appears that the gas was not turned off from the main on Wednesday night before the clerks left the building, and, owing to all the water having been "dried out" of the telescope slide in the vestry-clerk's private office, an escape of gas took place, and it was accumulating all night. The damage will exceed £50.

FATAL ACCIDENT AT THE ALLIANCE GAS-WORKS, DUBLIN.—A melancholy accident occurred at the works of the Alliance and Consumers Gas Company, on the morning of Tuesday, the 3rd inst., which resulted in the loss of three lives. It appears that a man named Thomas Clinton, in the employment of the company, went down to work in a well about 18 feet deep, and on landing at the bottom was observed to fall. A cry having been raised, several persons rushed to the spot, among them Mr. James Dunne, gas inspector, who at once descended for the purpose of raising Clinton. On arriving at the bottom of the well he also was seen to fall. Then a man named James Carney hastened to relieve Mr. Dunne, and quickly after him proceeded two other brave fellows named Francis Carter and James M'Cabe, who succeeded for a few seconds in pulling up both Dunne and Carney, until they, too, were compelled to succumb to the suffocating effects of the gas or foul air. When the five men were ultimately taken out, three of them—namely, James M'Cabe, James Carney, and Thomas Clinton—were dead. Thus two men have sacrificed their lives endeavouring to save a fellow-creature, and two others braved the danger of an untimely end with the same noble object. Francis Carter was at once brought to the City of Dublin Hospital, Baggot Street, where he received prompt attention from the accident surgeon on duty, Dr. Croly, assisted by Dr. Tuffnell. He is past danger, and doing well, and so is Mr. Dunne, who was attended to at the works, Sir John Rogerson's quay. M'Cabe was a bricklayer by trade, and a very clever workman, and had a wife and family. Dr. Davys, county coroner, held an inquest on the following day, at the Baggot Street Hospital, on the bodies of the three men. Professor Sullivan deposed that he had made an examination of the works in question, and was of opinion that carbonic acid gas and sulphuretted hydrogen gas were generated in the pit by natural causes, and that the accident could not possibly have been foreseen. Having received some other evidence, the jury returned the following verdict:—"We find that the deceased met their death on the 3rd of October by the inhaling of noxious gases. The jury is of opinion that the company should have used greater precautions to prevent accidents. We recommend to their kind consideration the friends of the deceased, and we are of opinion that the company should at once adopt ventilators for the pit." The coroner stated that one of the jurors dissented from that portion of the finding that the company should have used greater precautions.

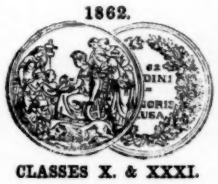
SCARCITY OF WATER IN LANCASHIRE.—The reservoirs of the Blackburn Water-Works Company are all but empty, and the company now only turn the water on for an hour each day. There are places in the town where the inhabitants have not had water on for more than a week. The people are consequently driven to all manner of straits, and water has to be carried by them from the lakes in the park, and from springs and other places in the outskirts of the town.

THE SUPPLY OF WATER IN LEEDS.—The Leeds municipal council has been occupied with the important question of the water supply of the town. The mayor introduced the subject, and moved that the attention of the Water-Works Committee should be called to the necessity of taking immediate steps to obtain a purer supply. While making this motion, the mayor declared, however, that he did not propose it because he considered the present water not good, but because he thought it prudent to look to the future, and to take early measures for meeting any emergency that may arise. Several members of the council took part in the discussion of the subject, all expressing similar views to those given utterance to by the mayor. Mr. Alderman Carter referred to several analyses that had been made of water from the Wharfe, both by Government officials and by chemists appointed by the council, and the result in all cases was that the water was good for the supply of a large town, and superior to that supplied to many other large towns in the kingdom. The motion of the mayor was adopted; and we may add that Dr. Hunter, who was sent down by the Board of Health for the purpose of making inquiry into the state of the public health of Leeds, has taken away samples of water from the Wharfe, for the purpose of testing their quality.

Advertisements.

GEORGE GLOVER & CO.'S
IMPROVED DRY GAS-METERS,
STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—



"George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	„	„	„	2·812.
Croll, Rait, and Co.	„	„	„	5·540.
Thomas Fletcher	„	„	„	15·121.
Joseph Boulton	„	„	„	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

THE
GAS-METER COMPANY, LIMITED,
(LATE CROLL, RAIT, & CO.,)

Beg to intimate that the printed report of the official inspector of Gas-Meters for the City of Manchester for the year ending **1864** shows the following comparison:—

NEW METERS TESTED.

Of the Gas-Meter Company, Limited . .	Dry . .	1116	
	Wet* . .	1292	
Total		——	**2408**
Of George Glover and Co.	Dry	383	

* The Unvarying Water-Line Gas-Meter, in regard to which the following extract from said report refers:—"The visiting justices will perceive, from a comparison of the tables now appended with those of last year (viz., 1863), *that there has been a large increase in the number of new wet meters tested, owing to the Gas Committee having substituted the wet for the dry in the case of hired meters.*"

Extract from printed report of the said official inspector for the year ending 1862, shows the following comparison:—

Croll, Rait, and Co., per centage of error on the number tested . . 8·671
George Glover and Co. „ „ „ . . 22·727

WANTED, three or four Men capable of taking charge of small gas-works.
Apply to J. VICKARY, Gas Engineer, EXETER.

TO GAS MEN.

WANTED, a Man capable of taking entire charge of a village Gas-Work, and of doing the various kinds of gas-fitting work, laying mains, &c.

Wages 21s. per week, with an excellent house on the premises, light, coal, and water.

Testimonials to be forwarded on or before the 1st day of November, to Mr. W. NEWMAN, Burnham, ESSEX.

WANTED, by the Reading Gas Company, a steady, active man as METER INSPECTOR. One who has a knowledge of gas-fittings, and can fix and do occasional repairs to meters, will have the preference.

Applications, with testimonials, stating wages required and age of applicant, to be addressed to the Manager of the Works, on or before the 30th of October inst.

Reading Gas-Works, Oct. 10, 1865.

COLCHESTER GAS-WORKS.

WANTED, on the 1st of March next, a MANAGER competent to superintend and conduct the above Works.

Salary £220 a year, with house on the premises, and coals and gas.

Applications, with testimonials or references, to be addressed to Mr. WM. WHITE, Secretary, the Rookery, COLCHESTER, before the 15th of November next.

Colchester, Oct. 11, 1865.

TO GAS COMPANIES.

WANTED, by the Advertiser, a situation as MANAGER of a country Gas-Work, or as FOREMAN under the manager of a large Gas-Work. Has had great experience connected with the manufacture of gas, the best mode of retort-setting in benches according to the size of the works; the laying of mains and services, indexing meters, and keeping carbonizing and office accounts; and has had considerable practice in the manufacture of sulphate of ammonia, now being so profitable.

Satisfactory testimonials and security.

Address, M. M., 9, Southampton Place, Gloucester Road North, LONDON.

WANTED, a Tar Distiller. Must be thoroughly accustomed to the work.
Apply, stating wages, to A. B., 81, Walsall Street, WOLVERHAMPTON.

TO IRON TUBE MANUFACTURERS, FOREIGN GAS COMPANIES, &c.

A Gentleman who is, and has been for many years, connected with one of the largest manufactories in the trade, is open to a re-engagement as TRAVELLER to a Manufacturer, or as CLERK or otherwise to a Gas Company. No objection to South America, or to an engagement for a term of years.

Address, R. K. J., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

THE Longton Gas Company, Limited, are in want of a SECRETARY and MANAGER. He must possess a practical knowlege of the business, and be prepared to enter upon the duties of the office at Christmas. Annual make of gas 15 millions.

Applications, stating age and salary required, with testimonials, to be addressed to the Chairman, H. Webberley, Esq., High Street, Longton, on or before Monday, the 30th inst.

No house provided.

By order of the Board, HENRY WOODALL, Secretary and Manager.

Gas-Works, Longton, Oct. 13, 1865.

CAST-IRON Socket-Pipes. Wanted, a quantity of 24-in.; also some smaller ones.
Particulars to be sent to the Chemical Company, Wars-ash, SOUTHAMPTON.

TO BE SOLD cheap, a Set of 10-in. CONDENSERS, consisting of 28 pipes, 21 ft. long, with syphon-boxes and connexions complete.

For price, &c., apply to Mr. KELSALL, Manager, Gas-Works, ASHTON-UNDER-LYNE.

Oct. 12, 1865.

TO MANUFACTURERS OF GAS APPARATUS AND OTHERS.

FOR SALE, a Share in a Patent for a very valuable invention, which has just been adopted at one of the largest metropolitan gas-works.

For particulars address, by letter, G. R., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO BE SOLD, for immediate removal (the purchaser to undertake the removal), a complete set of APPARATUS for MAKING GAS; suitable either for experimental purposes or for a large establishment wishing to make its own gas.

Two gasometers, 11 ft. diameter, 8 ft. deep, with iron tanks.

Six iron retorts, 4 ft. 6 in. long, 8 in. wide.

Hydraulic main.

A purifier, syphon-pump, force-pump, steam-boiler and fittings, several hundred feet of tubing (1 in. and 1¼), with pressure-gauges, and all the necessary connexions.

To be seen at the South Foreland Lighthouse, near DOVER, by application to Mr. HENRY KNOTT.

TOTTENHAM & EDMONTON GAS-LIGHT and COKE COMPANY.

NOTICE is hereby given that the ANNUAL GENERAL MEETING of this Company will be held at the Works, Willoughby Lane, near Park Station, Tottenham, on WEDNESDAY, the 25th day of October inst., at Three o'clock in the afternoon precisely, to receive the Report of the Directors, to declare a Dividend to the 30th of June last, and for the Election of Two Directors and an Auditor for the ensuing year; Messrs. James Samuel and A. A. Croll being the Directors, and Hugh Hereen the Auditor, who retire by rotation, and are eligible for re-election.

The Transfer Book will be closed on Tuesday, the 10th, until the 26th instant.

By order of the Board,
JAMES RANDALL, Secretary.

Edmonton, Oct. 10, 1865.

GREAT CENTRAL GAS CONSUMERS COMPANY.

NOTICE is hereby given that the TWENTY-NINTH HALF-YEARLY ORDINARY MEETING of the SHAREHOLDERS of the above Company, will be held at the London Tavern, Bishopsgate Street, on FRIDAY, the 27th of October, 1865, at Six o'clock in the evening precisely, to receive the Directors Report, and declare a Dividend for the half year ending June 30, 1865.

The Books in which Transfers of Shares are registered will be closed on Thursday, the 19th inst., and will be reopened on Saturday, the 28th inst.

R. M. MASSEY, Secretary.

28, Coleman Street, London, Oct. 5, 1865.

THE GAS-METER COMPANY, LIMITED.

NOTICE is hereby given that the ANNUAL GENERAL MEETING of this Company will be held at the Offices of the Company, 10, Coleman Street, City, London, E.C., on WEDNESDAY, the 25th day of October inst., at Eleven o'clock a.m., precisely, to receive the Report of the Directors, to declare a Dividend to the 30th of June last, and for the election of two Directors for the ensuing year.

Orlando Brothers, Esq., and Stephenson Clarke, Esq., are the Directors who retire by rotation, and being eligible, offer themselves for re-election.

By order of the Board,
GEORGE RAIT, Secretary.

Company's Offices, 10, Coleman Street, City, E.C., Oct. 10, 1865.

EQUITABLE GASLIGHT COMPANY.

NOTICE is hereby given that a HALF-YEARLY ORDINARY GENERAL MEETING of the SHAREHOLDERS of the above Company will be held at this Office on Tuesday, the 7th day of November next, to receive the Reports of the Directors and Auditors, and to declare a DIVIDEND upon the Capital of the Company for the half year ended the 30th of June last.

The Chair will be taken at One o'clock precisely.

Notice is hereby also given that the Transfer Books of the Company will be closed on Wednesday, the 25th inst., and re-opened after the meeting.

By order of the Board of Directors,
SAMUEL ANDREWS, Secretary.

Office, No. 21, John Street, Adelphi, Oct. 12, 1865.

BAHIA GAS COMPANY, LIMITED.

NOTICE is hereby given that the ORDINARY HALF-YEARLY MEETING of this Company will be held at the Offices of the Company, 3, Cloak Lane, Cannon Street, E.C., on TUESDAY, the 31st day of October, 1865, to receive the Report of the Directors, the Balance-Sheet approved by the Auditors, and for general purposes.

The Chair will be taken at Three o'clock precisely.

By order of the Board,
ARTHUR CLARKE, Secretary.

Oct. 3, 1865.

TO GAS ENGINEERS AND MANUFACTURERS.

THE Directors of the Aldershot Gas Consumers Company, Limited, invite TENDERS for the MANUFACTURE and SUPPLY of GAS at the Company's Works in Aldershot.

Tenders to be sent in on or before the 23rd of October, to W. RICHARD EVE (Solicitor), Secretary, Oxford Villa, ALDERSHOT, of whom particulars may be obtained.

NEATH WATER COMPANY—BRITON FERRY EXTENSION.
CONTRACT No. 1.

TO CONTRACTORS.

THE Directors of the Briton Ferry Water Supply are prepared to receive TENDERS for the construction of a STORAGE RESERVOIR and other Works.

Plans and specifications of the same may be seen at the Offices of the Neath Water Company at Neath, on and after Monday, the 16th inst.; where schedules of quantities and forms of tender may also be obtained.

Sealed tenders must be sent to Mr. WARD, C.E., 11, Great Queen Street, WESTMINSTER (endorsed "Tender for Reservoir"), not later than Monday, the 30th day of October inst.

The Directors do not pledge themselves to accept the lowest or any tender.

Oct. 10, 1865.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

S. CARPENTER, 3, Crampton Place, Bow Common, LONDON, E., Leather Seller and Glove Maker. Stokers Gloves and Finger-Gloves, and all kinds of Chamois Leather for cleaning lamps.

CHARLES PANTING,
CONSULTING PRACTICAL ENGINEER,
8, NEW BROAD STREET, LONDON, E.C.

Mr. Panting having had many years experience in designing and manufacturing gas apparatus, is prepared to advise with Companies and others on the laying out of new, and on the extension or improvement of existing gas-works.

Plans, specifications, and estimates furnished.

D. GRANT & CO.,
GAS-METER MANUFACTURERS
(Stamped according to the Sale of Gas Act).
STATION-METERS ANY SIZE.
PHOTOMETERS, EXPERIMENTAL METERS, PRESSURE-GAUGES, &c.
Price List on application.
GAS-METER WORKS, CROSSCAUSWAY, EDINBURGH.

J. STRACHAN,
CONSULTING GAS ENGINEER,
68, KING'S ROAD, READING,

Having had many years experience in the adjustment and regulation of the supply of gas to public lamps, begs to offer his services to Gas Companies, Corporations, or Boards of Health, on reasonable terms.

Contracts taken for laying mains, general repairs, and extension of gas-works.

BEST AND HOBSON,
LATE
ROBERT BEST,
100, CHARLOTTE STREET, BIRMINGHAM,
Manufacturers of
CHANDELIERS, PENDANTS, BRACKETS,
Brass and Iron Gas-Fittings, Steam and Water-Cocks, &c., &c.

Also,

PATENT WELDED IRON TUBES,
For Gas, Steam, Water, and other purposes.
GAS APPARATUS OF EVERY DESCRIPTION.
High-pressure Water-Valves and Cocks, &c., &c.
Plumbers Brassfoundry,
BRASS, COPPER, COMPOSITION, AND LEAD TUBES.
Works: Birmingham, and Great Bridge, Staffordshire.

WALTER MABON & CO.,
Engineers,
ARDWICK IRON-WORKS,
FAIRFIELD STREET, MANCHESTER,
MANUFACTURERS OF
IRON TANKS, GASHOLDERS,
GAS APPARATUS,
PIPES, VALVES, IRON ROOFS,
WROUGHT AND CAST-IRON GIRDERS.

DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the advertiser, 42, Parliament Street, WESTMINSTER. [Office of the JOURNAL OF GAS LIGHTING, &c.]

SHALE-FIELD TO LET.

THE SHALE-FIELD of WEST- FIELD, in the co. of FIFE, containing a seam of shale rich in oil, WILL BE LET for such a number of years as may be agreed on. A rough coal, well suited for decomposing the shale, will be let along with it. It is situated on the lands of Capledrae, well known for their rich gas-coal, which produces the largest quantity of oil of any coal in Scotland, except Boghead.

Apply to the Proprietors, J. and R. AYTOUN, 3, Fettes Row, EDINBURGH.

ESTABLISHED 1827.

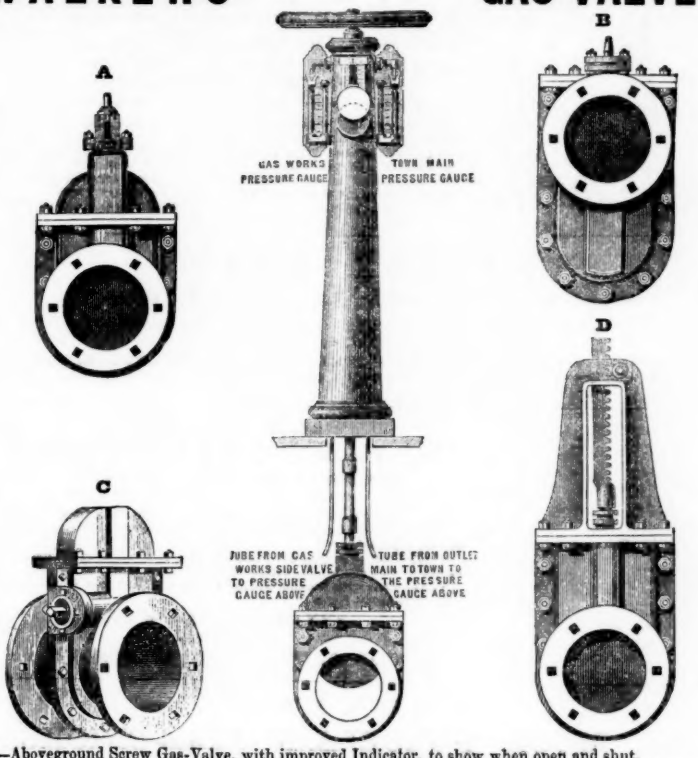
JOHN BEVERLEY and SON,
MARK LANE, LEEDS.

Manufacturers of Patent Metallic Wet Gas-Meters, Station-Meters, Experiment-Meters, Governors, Pressure-Gauges, Syphon-Pumps, &c.

Inventors and sole manufacturers of Beverley's double-cased Gas Cooking Apparatus, unequalled in economy, comfort, and cleanliness.

Meters of any maker altered and put into complete repair, to meet the requirements of the Sale of Gas Act.

WALKERS GAS-VALVES



A—Aboveground Screw Gas-Valve, with improved Indicator, to show when open and shut.
B—Underground Screw Gas-Valve, for shallow Street-Mains, made with or without an Indicator.
C—Internal Rack-Valve, with wrought-iron Pinions and machine-cut Teeth.
D—Ordinary Rack and Pinion-Valve, with strong, undamageable Racks and Pinions—made as shown, or boxed up for Street-Mains.
E—Regulating Indicating Column and Valve, for governing the supply of Gas to the Town.

LITTLE SUTTON STREET, LONDON, E.C.

TUBE-MILLS AND GAS-FITTING MANUFACTORY,
WALSALL, STAFFORDSHIRE.

LAMBERT BROTHERS

Desire to inform Managers of Gas-Works, Local Boards, and large Consumers of Gas, that the patent

BAT'S-WING Economizer Gas-Burner for Street-Lamps

is now ready for delivery. Also various larger sizes. The Factory Bat's-wing, burning at 18/10ths pressure, shows a steady sheet of flame *eight inches wide* by *three and a half inches deep*. Schedules of consumption for all sizes, proved under various pressures from half-inch to 3-inch (both Union, Jet, and Bat's-wing), on application to

LAMBERT BROTHERS,
OLD TUBE AND FITTING WORKS, WALSALL.

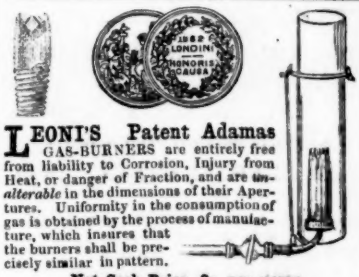
ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

EDMUND SMITH,

GRASBROOK, HAMBURG,

would respectfully call the attention of engineers and managers of gas-works to his Newly Improved GAS-METER, patented 1862 in England, and the principal parts of the Continent.

Price-lists and tenders for gas-meters, experimental station-meters, experimental holders, governors, purifiers, gasholders, pressure-gauges, gas and water fittings, &c., are forwarded on application.



LEONI'S Patent Adamas GAS-BURNERS are entirely free from liability to Corrosion, Injury from Heat, or danger of Fraction, and are *unalterable* in the dimensions of their Apertures. Uniformity in the consumption of gas is obtained by the process of manufacture, which insures that the burners shall be precisely similar in pattern.

Net Cash Price, 8s. per gross.

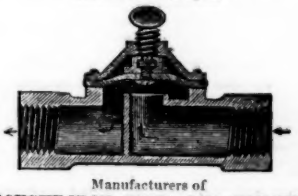
Patentee and Sole Manufacturer, S. LEONI, 34, St. Paul Street, New North Road, LONDON, N.

NATURAL
HYDRATED OXIDE of IRON
constantly on Sale. Apply to
MARTYN DENNIS AND CO.,
LIVERPOOL.

THOMAS LAMBERT & SON,

SHORT STREET, LAMBETH, LONDON.

CARTER'S SAFETY GAS-VALVES,
Made to suit every Description of Fittings.
Section of Valve open.



Manufacturers of
WROUGHT-IRON PIPES AND FITTINGS,
SLUICE-VALVES AND STOP-COCKS,
STOCKS, TAPS, & DIES,
CHANDELIERS, PENDANTS, &c.
PATENT MERCURIAL GAS-REGULATORS.

EDWARD COCKEY & SONS,

IRON-WORKS, FROME SELWOOD,

PATENT GAS-VALVES.

A PRIZE MEDAL

WAS AWARDED TO THE PATENTEES AT THE INTERNATIONAL EXHIBITION OF 1862.

These Valves are formed of two cylinders, working one on the other horizontally, having their faces ground perfectly gas-tight.

They are adapted either as central valves, for two, three, or four purifiers—as bye-passes—or as inlet and outlet-valves for gasholders.

They have been tested for five years, and are in use in many important Gas-Works in various parts of the Kingdom. About ninety of them have been fixed, and the most satisfactory reports of their advantages continue to be received.

The simplicity of their construction and the ease with which they are managed are strong recommendations in Gas-Works. The index enables the manager of the works to see at a glance the direction in which the gas is passing.

The time which they have been in use proves their durability; and if, in course of many years, the faces should leak, they can be easily reground without removal from their places, and made as tight as when new.

The following Testimonial has been received from R. P. Spice, Esq.:—

"DEAR SIRS, "*County Chambers, Cornhill, London, E.C., Jan. 22, 1864.*

"It is with pleasure that I comply with your request for a few words respecting your centre valves.

"I have them in use on works which I hold on lease, I have adopted and fixed them on several works which I have remodelled, and I now use no others; indeed, the satisfaction they give me after several years experience of their working is unqualified and complete.—I am, dear sirs, yours very truly,

"*Messrs. Cockey and Sons, Frome.*" "R. P. SPICE."

WEALE'S SERIES.—Catalogue on application.

A TREATISE ON GAS-WORKS, and the Practice of Manufacturing and Distributing Coal Gas. By SAMUEL HUGHES, C.E.
Second edition, illustrated, revised by WILLIAM RICHARDS, C.E., price 3s.
VIRTUE BROTHERS and Co., Amen Corner, LONDON.

EIGHTH THOUSAND.

AGRICULTURAL VALUE OF REFUSE GAS LIME.
By PROFESSOR VOELCKER,
Professor of Chemistry to the Royal Agricultural Society of England.
Price 10s. per 100, or by post, 10s. 6d.
London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

NOW READY,

VOL. XIII. of the JOURNAL of GAS LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1864, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., IV., V., VI., VII., VIII., IX., X., XI., and XII. are still on sale.
W. B. KING, 11, Bolt Court, FLEET STREET, E.C.

GAS LEGISLATION, 1865.

Now ready,
Reports of the Proceedings before Select Committees of the House of Commons.

BATH GAS BILL—price 1s., by post 1s. 1d.
KENT GAS BILL—price 1s. 6d., by post 1s. 7d.
PRESTON, EXETER, AND FOLKESTONE GAS BILL—price 1s., by post 1s. 1d.
STROUD GAS (Local Government Supplemental, No. 3) Bill—price 1s., by post 1s. 1d.

Also, price 2s., by post 2s. 1d.,
Reports of the Proceedings before Select Committees of the House of Lords on the
LEAMINGTON, LIVERPOOL, & RAMSBOTTOM GAS BILLS.
HANLEY GAS BILL.
UNITED GENERAL (DUBLIN) GAS BILL.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

RUTTER ON GAS LIGHTING.
Just Published, Fcap. 8vo., toned paper, pp. 71, sewed, price 6d.,

ADVANTAGES of GAS in PRIVATE HOUSES.
A HANDY BOOK FOR GAS CONSUMERS:
TELLING THEM WHAT TO DO,
AND WHAT NOT TO DO.
By J. O. N. RUTTER, F.R.A.S.
A new and revised edition, and the 193rd thousand.
LONDON:
VIRTUE BROTHERS AND Co., 1, AMEN CORNER, PATERNOSTER ROW, and all Booksellers. 1865.
A cheaper edition (the 194th thousand), on plain paper, but in all other respects the same as the above, and which is intended for distribution by gas companies, is also ready, price £12. 12s. per 1000 copies, and £1. 7s. 6d. per 100.

Crown 16mo, pp. 20,

GAS IN DWELLING-HOUSES: ITS USES, CONVENIENCES, AND ECONOMY.
A revised and enlarged edition, and the 44th thousand.
Price—1000 copies, £3. 10s.; 500 copies, £1. 17s. 6d.; any smaller number at 8s. 6d. per 100.
When 1000 copies are ordered, the official title, scale of prices, and other information relating to the business of the Company, will be printed on the covers without extra charge.
All orders and inquiries for the two last-mentioned editions to be addressed, direct, to the AUTHOR, Black Rock, BRIGHTON.

SAMUEL CUTLER, Gasholder MAKER and CONTRACTOR
For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.
PROVIDENCE IRON WORKS,
MILL WALL, POPLAR, LONDON, E.
Main Laying and Gas-Works erected complete.

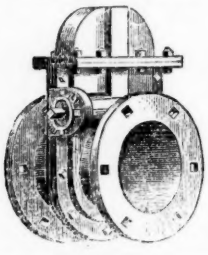
OXIDE OF IRON.
We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
FRANCIS RITCHIE & SONS,
BELFAST.

HONOURABLE MENTION. INTERNATIONAL EXHIBITION, 1862.

CARTWRIGHT & CO.,
MANUFACTURERS OF
GASFITTINGS, BRACKETS, GASELIERS,
&c., &c.
PATENTEES OF THE ANHYDROUS SLIDE, whereby the use of Water and Heavy Weights are dispensed with.
39, 40, 41, & 42, LOMBARD STREET,
BIRMINGHAM.

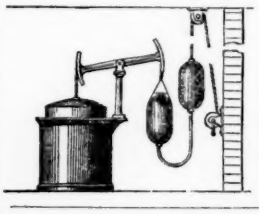
F. & C. OSLER,
45, OXFORD STREET, LONDON;
Manufactory—Broad Street, Birmingham—Established 1807.
MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.
ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards
Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable or DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.
THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

WALTER FORD,
159, GRAY'S INN ROAD, LONDON.
MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.
Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.



REDUCED PRICES OF
BRYAN DONKIN & CO.'S
IMPROVED GAS VALVES
WITH WROUGHT-IRON PINIONS
from 2 inches to 18 inches, price 9s. 6d. to 12s. per inch diameter
List of prices, with full dimensions of all sizes up to 36 inches, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
Valves made with Outside Racks to order. Also, Screw Water-Valves with Gun-Metal Faces.
BRYAN DONKIN & CO.,
ENGINEERS,
NEAR GRANGE ROAD, BERMONDSEY.

MARTIN'S
LEE MOOR PORCELAIN FIRE-BRICKS,
Containing no Lime, and only ·45 of Oxides, resist the strongest heats, and will last for Gas-Works longer than any others.
Samples and prices sent, and the highest references given, on application to
MARTIN BROTHERS,
ST. AUSTELL, CORNWALL.



By Her Majesty's Royal Letters Patent.
KEELING'S
STATION GOVERNOR REGULATOR.
N.B.—The largest Governor in the World is now being supplied (viz., 36-in. inlet) to one of the London Gas Companies. All orders to be addressed to
Mr. J. KEELING, Consulting Gas Engineer,
12, BERMONDSEY NEW ROAD, LONDON, S.E.

WALKERS'
WOOD PURIFIER SIEVES OR GRIDS.
These celebrated Sieves, used for either Lime or Oxide, are of the most DURABLE KIND, STRONG AND UNDAMAGEABLE, and do not warp. The most satisfactory references can be given by the numerous large and small gas companies who use them extensively.
They are made by Machinery invented for the purpose of the best Woods, FROM TREES SELECTED EXPRESSLY by
C. AND W. WALKER,
AT THEIR MIDLAND WORKS, DONNINGTON, NEWPORT, SHROPSHIRE.
OFFICE: LITTLE SUTTON STREET, LONDON, E.C.

WOLVERHAMPTON RETORT WORKS.
ESTABLISHED **1840.**
JOHN EUNSON AND SON,
GAS ENGINEERS, AND MANUFACTURERS OF CLAY RETORTS,
AND FIRE GOODS IN GENERAL,
WOLVERHAMPTON.
Retort Mouthpieces, Bolts, Nuts, and every description of Wrought-Iron Work.

JOSEPH BOULTON,
PATENT DRY AND IMPROVED WET GAS-METER MANUFACTURER,
80, KING'S CROSS ROAD, AND
10½, GREAT PERCY STREET, CLERKENWELL.
The superiority of these Meters over all others hitherto invented has gained for them unparalleled patronage by all the principal Gas Companies and the Trade in general, on account of their unerring registration, efficient workmanship, and the quality of the materials used in their construction.
STATION-METERS, GOVERNORS, PRESSURE-GAUGES, & EXPERIMENTAL METERS,
ON THE MOST IMPROVED PRINCIPLE.
Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament.
ALL METERS WARRANTED.

GAS & GENERAL ENGINEERING OFFICES,
53 FREDERICK STREET, EDINBURGH.

MR. JOHN ROMANS, Civil and Practical Engineer, may be consulted at the above address on all matters pertaining to Gas-Works, Water-Works, and other Engineering questions.

Plans and Specifications Furnished, Works Erected and Repaired, or taken on Lease for a term of years.

Mr. Romans is also agent in Edinburgh for supplying High-Classed Scottish Cannel Coal and Fire-Clay Goods.

GREAT FIRE
in Tredegar, Monmouthshire.
Another Proof of the Security of
C. H. GRIFFITH'S FIRE & THIEF PROOF SAFES.

[COPY OF LETTER.]

"Mr. Griffiths, *Tredegar, April* 7, 1865.

"Sir,—I have much pleasure in stating that the 'Fire-Proof Safe' you made me about three years since, has been the means of preserving the whole of my books, valuable documents, &c., from the disastrous fire which consumed my premises on the 24th of last month. Although exposed for hours to the most intense heat, the Safe opened without much difficulty.

"Have the goodness to forward me another as soon as possible, and oblige

"Yours very respectfully,

"To Mr. C. H. Griffiths, "E. HORLICK.
"Fire-Proof Safe Manufacturer,
"23, Cannon Street West.

"P.S.—You have my sanction to use this in any way you think proper, not only for your benefit, but that of the public."

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE-BRICKS, CLAY RETORT
&c. &c.
RETORT MOUTHPIECES, BOLTS, NUTS, &c.

STOURBRIDGE FIRE-CLAY WORKS.

E. BAKER & CO.,
24 WHARF, HARROW ROAD, PADDINGTON, W.

FIRE-BRICKS, LUMPS, SQUARES, and TILES of all dimensions.
GAS-RETORTS always in stock.
GARDEN EDGINGS of various patterns.
ORNAMENTAL BUILDING BRICKS.
GRATE BACKS in various designs.
Contracts entered into to set Retorts, erect Furnaces, &c.
Shipments on the shortest notice.

THOMAS CARR & SON,
MANUFACTURERS OF
FIRE-BRICKS, LUMPS, TILES, RETORTS,
&c. &c.
SCOTSWOOD FIRE-BRICK WORKS,
NEAR
BLAYDON-ON-TYNE.

HARRIS and PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY
MANUFACTURERS OF
FIRE BRICKS, GAS RETORTS, &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.
Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.

NB A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches. 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

HANCOCK'S INDIA-RUBBER GAS-TUBING.

All sizes, from ¼ in. to 4 in. diameter and upwards.
Also,
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Roll or Sheet) for STEAM-ENGINES.
STRAPS (Rubber and Canvas) for DRIVING MACHINERY.
HOSE-PIPES to convey HOT or COLD WATER.
COKE-HOSE, made specially for rough usage.
GAUGE GLASS RINGS and WASHERS.
SUCTION and DELIVERY HOSE-PIPES for PUMPS, FIRE-ENGINES, BREWERIES, and FACTORY purposes.
BRASS JETS, STOP-COCKS, SPREADERS, and UNION CONNECTING-JOINTS fitted to ditto.
Illustrated Price-Lists on application.

JAMES LYNE HANCOCK,
Vulcanized India-Rubber Works,
GOSWELL MEWS, AND 266, GOSWELL ROAD
LONDON, E.C.

Trade Mark. **THE MEDAL FOR 1862.**
THE ONLY PRIZE MEDAL AWARDED FOR TUBES AND FITTINGS.

CROWN TUBE-WORKS,
WEDNESBURY, STAFFORDSHIRE.
WAREHOUSE—81, UPPER GROUND ST., LONDON.

JAMES RUSSELL & SONS,
Patentees and First Makers of Wrought-Iron Tubes.

W. J. HOLLANDS,
IRON MERCHANT,
31, BANKSIDE, LONDON, S.E.

SOCKET, FLANGE, HOT-WATER PIPES, AND ALL CONNEXIONS; RETORTS, HYDRAULIC MAIN, LAMP-COLUMNS, &c.; AND EVERY DESCRIPTION OF CASTINGS AND WROUGHT-IRON-WORK FOR GAS AND WATER-WORKS, STEAM, AND GENERAL PURPOSES.

N.B.—All goods kept in stock, and supplied at wholesale prices. Estimates given, and orders by post punctually attended to the same day.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
DURHAM.

Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

ALFRED PENNY, Gas and CONSULTING ENGINEER,
WENLOCK IRON WORKS,
21 & 22, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications, addressed to J. SUGG and Co., GHENT, will receive immediate attention.

GLOBE METER-WORKS, OLDHAM.

NEWTON & BRADDOCK,
Manufacturers of
IMPROVED CONSUMERS GAS-METERS,
STATION-METERS, GOVERNORS, GAUGES, &c.
Sole Manufacturers of their
PATENT COMPENSATING GAS-METER,
This Patent being applicable for the repair of old Meters.
STATION-METERS,
of any size, on the best principle.

CATHELS'S Patent Four-Way Disc GAS-VALVES, applied to Purifiers, Gasholders, or other apparatus, save from ONE-HALF to TWO-THIRDS the number of ordinary Valves and Connexions. They are simple, strong, and durable; and having no ground faces or rubbing surfaces, cannot get set fast however long they may remain unmoved. The direction in which the Gas is passing can also be seen at a glance.

Illustrated Circulars, Prices, &c., furnished on application to Mr. E. S. CATHELS, Gas-Works, SHREWSBURY.

TO GAS ENGINEERS AND OTHERS
CONNECTED WITH GAS COMPANIES WORKS.

WOOD SIEVES for Gas Purifiers.

BENJAMIN CARPENTER begs to inform the above that he has been supplying most of the principal Gas Companies Works in London, &c., with WOOD PURIFYING SIEVES for the last four years; and, he feels sure, he has given every satisfaction, by the continued favour he has received from gentlemen knowing the benefit derived by their use.

Having, through the introduction of improved machinery, effected a great saving in their manufacture, he is now enabled to offer them at a very Low Price. Being perfectly satisfied of their Superiority over all other descriptions, on account of their Strength, Cheapness, Durability, Non-Liability of Corrosion, and Facility of Cleaning, and having devoted four years to the Perfection of this article, he feels that nothing has been lost sight of in their manufacture which would tend towards Durability and Efficacy.

The Trade supplied, and Orders executed on the shortest notice.

Estimates forwarded on application to

BENJAMIN CARPENTER,
Wood Sieve Maker for Gas Purifiers,
14, JOHN STREET, RODNEY STREET,
PENTONVILLE ROAD, LONDON, N.

FREDERICK RICHARDS,
CONSULTING AND GENERAL ENGINEER,
WILMSLOW, CHESHIRE.

Plans, Specifications, and Estimates made for New or the Alteration of existing Gas-Works.

Gas-Works leased, or Estimates given for the Manufacture of Gas per Contract for a term of years.

Manchester Office: 8, Cateaton Street.

GAS COAL.

MESSRS. RICHARD EVANS & CO., Haydock Collieries, near St. Helen's, are prepared to SUPPLY their best GAS COAL to Gas Companies on favourable terms.

This Coal is extensively used by some of the largest Gas Companies in the Kingdom.

It produces 9,400 cubic feet of 17-candle power, and yields 13 cwt. of coke per ton.

JAMES NEWTON & SONS,
(Established 1820,)
FIRE-BRICK AND TILE MERCHANTS,
Wholesale and for Exportation,
FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

J. T. B. PORTER & CO.,
GAS ENGINEERS,
MANUFACTURERS AND CONTRACTORS FOR GAS-WORKS
Of any extent at Home and Abroad,
GOWTS BRIDGE WORKS, LINCOLN,
AND
JOHN STREET, ADELPHI, LONDON, W.C.

JAMES MILNE & SON,
AS ENGINEERS, GAS-METER, GAS APPARATUS, AND GASFITTINGS MANUFACTURERS,
EDINBURGH,
& 2, KING EDWARD STREET, NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD,
CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water-Works, including Iron Retorts, Socke and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

CHARLES HORSLEY, Agent.

FRASER'S PATENT RIBBED CAST-IRON RETORTS are being introduced at the Gas-Works, Derby, Shrewsbury, Portsea, Nottingham, Syston, Whitwick, Barrow-in-Furness, Seaham, Ripborough, Leighton, Loughborough, Corwen, Castle Donnington, Kegworth, Royston, Woking, Swadlincote, Rugby, Carlow in Ireland, Stornoway, N.B.; also at Gibraltar and Montreal, &c.

Apply to Mr. A. C. FRASER, Gas-Works, LOUGHBOROUGH.

ECONOMY IN GAS MAKING.
GREATER BRILLIANCY OF LIGHT,
LESS SMOKE,
AND
NO NAPHTHALINE,
by using
WARNER'S PATENT ANHYDROUS OXIDE OF IRON,

Which, in addition to purifying Gas from all the Sulphuretted Hydrogen and Carbonic Acid, decomposes at the same time the whole of the
AMMONIA,
and a portion of the Bi-sulphide of Carbon.

This is the only material yet discovered which will decompose all the "Ammonia" contained in crude or unwashed Gas.

The Hydrogen liberated through the decomposition of the Ammonia unites with the excess of carbon, and gives an increased yield of Gas of from 10 to 15 per cent., of greater brilliancy of light and with less smoke.

The Oxide can be renovated by simple exposure to the air.

LONDON OFFICES, 17, LAURENCE FOUNTNEY LANE.

WARNER'S SILICATE OF IRON PAINT.

This Paint, which is suitable for every description of work, is not affected by Sea Water, or by the Strongest Acids, and, being incorrodible, is much superior to the Oxides of Iron at present in use, they being, in fact, rusts themselves.

LONDON OFFICES, 17, LAURENCE FOUNTNEY LANE, E.C.

HIGH-PRESSURE GAS-METERS.

MESSRS. WILLIAM & BENJAMIN COWAN beg respectfully to call attention to Messrs. Newbigging and Hindle's Patent

AIR-TIGHT INDEX-BOX,

Which supplies a want long felt by Gas Companies, and hitherto very inadequately provided for. The PATENT AIR-TIGHT INDEX-BOX prevents the ascent of water by the seal tube, even under the highest pressures. It is therefore of paramount utility in irregular and hilly districts, and even in level localities it is of great service, as it removes the objections to cork and other slide pendants.

As no raised Index is needed, Meters can be made of a convenient height, for fixing on shelves, under benches, or in any confined or limited space.

For a full statement of its advantages, apply to the Sole Manufacturers,

WILLIAM AND BENJAMIN COWAN,

WET & DRY GAS-METER MANUFACTURERS,

Buccleuch Street Works, Edinburgh, & 13, Strutt Street, Manchester.

Established 1827.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS,

AND OF

KAY'S PATENT HYDRAULIC VALVE GAS-METERS; | **COWAN'S PATENT SIDE VALVE GAS-METERS;**

All of which may be had with Newbigging and Hindle's Patent Air-Tight Index-Boxes.

ALSO, MANUFACTURERS OF

IMPROVED DRY GAS-METERS.

All of the above being Stamped according to Act of Parliament.

GOVERNORS, STATION-METERS, PRESSURE REGISTERS & GAUGES,

MINUTE-CLOCKS, PHOTOMETERS, EXPERIMENTAL METERS,

AND OTHER DESCRIPTIONS OF GAS APPARATUS.

GEORGE ANDERSON,

GAS & CONSULTING ENGINEER, 16, ADAM STREET, ADELPHI, LONDON, W.C.

ANDERSON'S PATENT RETORT SETTINGS.

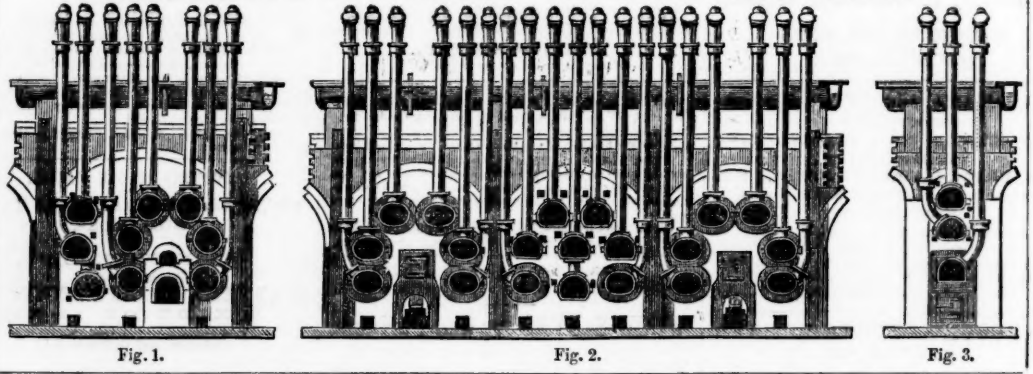


Fig. 1. Fig. 2. Fig. 3.

The very general reduction which many Gas Companies have been compelled to make this winter in the price of gas, has induced me to publish illustrations of my Retort Settings, which have been at work in many places for several years, during which time they have been much improved, whereby a great saving is effected in the amount of coke burnt, with great duration of Retorts and economy of labour.

Fig. 1 represents an arrangement for medium sized works. Either the whole 9 or only 6 of the Retorts may be heated by the alteration of two dampers.

Fig. 2 is what I adopt in the largest class of works. The Retorts in the centre bed are of iron, and receive the modified heat from the beds of Clay Retorts on either side.

In both figs. 1 and 2 all the furnaces, or a portion of them, may be of tar or coke. The tar furnace is adapted to burn *only* tar; and, without smoke or destruction of the Retorts, a tar furnace can be converted to a coke one, or *vice versâ*, without interfering with the Retorts.

Fig. 3 is what I adopt for small works. In it, like fig. 1, 2 or 3 Retorts can be heated by the alteration of two dampers. In each case this very often postpones for weeks, if it does not prevent altogether, the lighting up of an extra fire. These modes of setting can in most cases be adapted to existing arches.

Contracts made for the erection of the Retorts if necessary.

Also my PATENT PISTON EXHAUSTER combined with Steam Engine when required.

Also my PATENT FOUR-WAY VALVES, *one* of which answers the purpose of *three* ordinary Valves when applied to Purifiers, or bye-pass and shut-off to Station-Meters, &c., and obviates the objection of foul gas attendant on the Centre Water-Valve.

Also my CONCENTRIC GAS GOVERNOR, which occupies about half the space of the old-fashioned Governor.

TO GAS COMPANIES AND THE TRADE.

NOTICE OF REMOVAL IN CONSEQUENCE OF THE LATE FIRE.

J. DEFRIES AND SONS,

Gas Engineers, and Manufacturers of

CRYSTAL, BRONZED, & ORMOLU Chandeliers;

IMPROVED CRYSTAL STAR & SUN LIGHTS;

VESTIBULES, and every description of Gas-Fittings.

Temporary Show-Rooms:—16 & 17, COMMERCIAL STREET, WHITECHAPEL,

Five Minutes Walk from their late Establishment, 147, HOUNDSDITCH.

J. D. & SONS beg most respectfully to inform Gas Companies and the Trade that their CITY SHOW-ROOMS are now complete with every description of Lighting Mediums, including Registered Designs of Mediæval Gas-Fittings, Crystal, Bronzed, Ormolu, and Electro-Plated Chandeliers, Brackets, Vestibule-Lights, Bronzed and Gilt Statuettes.

Special Designs prepared in perfect accordance with architectural arrangements. Estimates furnished for the Lighting and Fitting up of Theatres, Music-Halls, and Public or Private Buildings with Gas.

GAS-MOONS of the Newest Designs.

The PATENT GAS-REGULATOR and PURIFIER reduced to **6s. 6d. per dozen.** *Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for* 1864 *are now complete.*

Works: LONDON and BIRMINGHAM.

The CRYSTAL CEILING, with Ventilating Apparatus, manufactured by J. Defries and Sons for the Strand Music-Hall.

E. J. & J. PEARSON,

DELPH & TINTAM ABBEY FIRE-CLAY & BRICK-WORKS,

STOURBRIDGE,

PROPRIETORS OF

BEST GLASS-HOUSE POT & CRUCIBLE CLAY;

MANUFACTURERS OF

GLASS-HOUSE POTS, CRUCIBLES, GAS-RETORTS, & FIRE-BRICKS OF EVERY DESCRIPTION.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES & FITTINGS,

PLAIN, GALVANIZED, & ENAMELLED, for Gas, Steam, and Water, from ⅛ in. to 6 in. bore.

STOCKS, TAPS, and DIES, GUN METAL GLAND-COCKS, WATER-GAUGES, &c.;

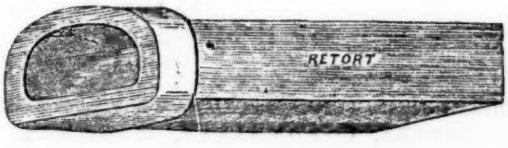
PATENT LAP-WELDED IRON TUBES,

For Locomotive and Marine Boilers, &c.

LONDON WAREHOUSE—No 66, QUEEN STREET, E.C.

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Burs, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

THE

GAS-METER COMPANY, LIMITED,

A. ANGUS CROLL, C.E., Chairman.

GEORGE RAIT, MANAGING DIRECTOR. T. G. BARLOW, C.E., CONSULTING ENGINEER.

CROLL'S DRY GAS-METER,

(Invented and Patented in 1844, since which time 200,000 of these Meters have been manufactured by Mr. CROLL,)

Obtained **PRIZE MEDALS** at the EXHIBITIONS of London, 1851, of New York, 1853, and Paris, 1855.

IMPROVED in 1858,

And was awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for

"GOOD CONSTRUCTION and SOUND WORKMANSHIP."

Now manufactured by the GAS-METER COMPANY, LIMITED, KINGSLAND ROAD, LONDON; and, for the purpose of obtaining greater accuracy in all its parts, the most perfect machinery has been adopted, "By which the construction of the Meter is much simplified, while its liability to get out of order is diminished." (See report of T. G. BARLOW, Esq., C.E.)

ALEXANDER WRIGHT,

55 and 55A, MILLBANK STREET, WESTMINSTER, S. W.,

MANUFACTURER OF

COMPENSATING & OTHER WET & IMPROVED DRY GAS-METERS,

Of the best material and workmanship, carefully adjusted to meet the requirements of the SALES OF GAS ACT.

STATION-METERS & GOVERNORS,

WRIGHT'S REGISTERING PRESSURE-GAUGE, EXHAUSTER REGISTER, & REGULATOR;

STANDARD TEST GASHOLDERS;

Consumers' Governors; Inspectors' Pocket, King's, and all other kinds of Pressure-Gauges; Thermometers for Condensers, Pressure Registers, &c., &c.

EXPERIMENTAL TESTING APPARATUS,

Employed by the best experimenters in this country and on the continent, and by the Gas Testers in the London districts.

PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, BI-SULPHURET OF CARBON TEST, THOMPSON'S BROMINE AND HEATING POWER OF FUEL TESTS, IMPROVED ALKALIMETER, EXPERIMENTAL METERS AND GOVERNORS, MINUTE CLOCKS, &c., &c.

"ANALYSIS OF GAS FOR PRACTICAL MEN,"

New and Enlarged Edition, with "Gas-Meter Testing under Sales of Gas Act," p.p. 25 Stamps.

R. LAIDLAW & SON,

GAS ENGINEERS, IRON & BRASS FOUNDERS

Alliance Foundry, 147, East Milton Street, and Barrowfield Iron-Works,

GLASGOW;

AND AT SIMON SQUARE, EDINBURGH;

MANUFACTURERS OF

STATION & CONSUMERS METERS, ALL SIZES;

WROUGHT-IRON TUBES, FOR GAS, WATER, & STEAM; CAST-IRON RETORTS & PIPES,

HYDRAULIC MAINS, CONDENSERS, WASHERS, SCRUBBERS, PURIFIERS, & TANKS.

GASHOLDERS;

GOVERNORS, SLIDE-VALVES, &c.;

WROUGHT & CAST IRON ROOFS & HOUSES.

Contractors for Gas-Works of any Magnitude. *Plans, Specifications, and Estimates furnished.*

LONDON ESTABLISHMENT—190, STRAND.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,

invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

MANUFACTURERS OF

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, VESTIBULES, BRACKETS, PENDANTS;

DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

IMPROVED FULL-WAY CARTER'S VALVES (much approved of);

GAS-STOVES, and every article connected with Gas Apparatus.

CAST & WROUGHT-IRON PIPE BLACK & GALVANIZED. COPPER. TIN, BRASS, & COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER

for clearing out Mains, Services, and Interior Fittings—65s. net.

Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

Sole Manufacturers of Church and Mann's Photometer.

Large Pattern Books with every description of Gas-Fittings, Chandeliers, &c., with complete Book of Prices, 12s.

London: Printed by WILLIAM BOUGHTON KING (at the Office of Clayton and Co., 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, October 17, 1865.